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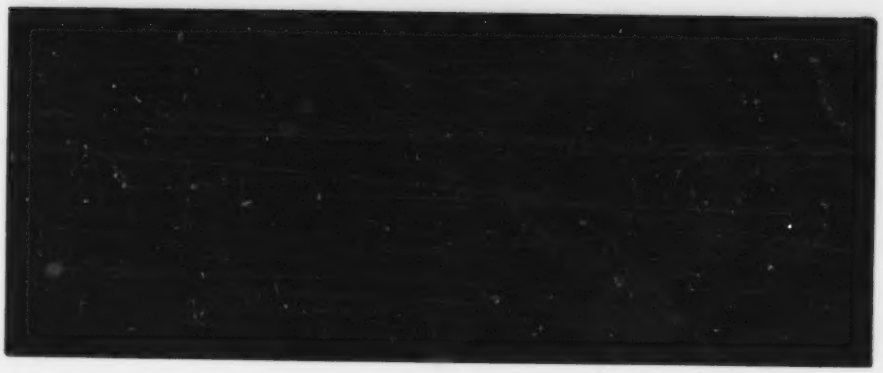

Technical/Final Report
to
Saskatchewan Agriculture Development Fund

The Market Potential and Feasbility of Goat Diary Processing in Saskatchewan

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Harvest Foods Ltd.

Food Industry Consultant

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Market Potential and Feasibility
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in
Saskatchewan

Final Report

Prepared for AND FUNDED BY :
Saskatchewan Agriculture
Agricultural Development Fund

November, 1986

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Abstract

Although goat dairying in Saskatchewan is growing, it remains a cottage industry. Unlike most provinces, no commercial processing or retail marketing occurs. Milk is sold directly by producers to consumers, demand being based largely on allergies to cow's milk. Production is approximately 0.1% of cow's milk production. The major constraint to industry expansion is the lack of licensed processors. An integrated producer/processor operation is seen as the most practical solution. Since dairy industry suppliers are unable to provide equipment of a sufficiently small scale, the consultants have conceptualized a mini-dairy using restaurant-style equipment. Given expected sales volume to a major urban center, the mini-dairy could provide part-time income for the owner/operator. Recommendations to facilitate the design, construction, and operation of a mini-dairy include developing guidelines to interpret existing regulations, and technical assistance from Saskatchewan Agriculture and the University of Saskatchewan.

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EXECUTIVE SUMMARY

The number of dairy goats in Saskatchewan has grown in recent years. As of the 1981 census there were 4,317 goats on 961 farms in the province, for an average of 4.5 goats per farm. The latter figure indicates the diffuse nature of the goat milk shed.

The industry in Saskatchewan is a cottage-scale industry, with no commercial processing or retailing occurring. With the exception of limited retail sales of imported evaporated and powdered milk and other products, milk sales are made at the farm-gate. Production is approximately 0.1% of the output of the cattle dairy industry. The market demand is largely from persons allergic to cow's milk.

A survey of major Saskatchewan producers indicated average weekly milk production of approximately 4,000 litres, and average weekly farm gate sales of 1,055 litres for the entire industry. Seasonal variations in milk production are substantial. Average prices were $1.26/litre for pasteurized milk, and $1.18/litre for raw milk. Most producers interviewed were located close to urban centres, and their sales to these centres ranged from 0.9 to 12.6 litres per thousand population per week, with an average of 2.4 litres per thousand population per week.

Over half of the producers in Saskatchewan have entered the industry in the last 5 years. The majority of the producers are interested in expanding their operations, and in supplying milk to a processor. Several producers are also interested in establishing processing facilities on their farms. It appears therefore, that while the level of experience in the industry is limited, significant growth is occurring, and there is considerable interest and enthusiasm in developing a commercial industry.

Compared to most other provinces, Saskatchewan is underdeveloped in the processing of goat's milk. The major constraint to expansion of the industry is the lack of licensed processors which can sell milk to retail markets. Custom processing is precluded due to the small volumes to be processed. Certified raw milk sales are not recommended due to the lack, or potential lack, of retail distribution opportunities. An integrated producer/processor operation is seen as the most practical processing alternative.

Dairy industry suppliers are unable to provide equipment of a sufficiently small scale to economically process the small volumes required. To overcome this problem, the consultants have conceptualized a 100 l batch processing mini-dairy which could be established using restaurant-style equipment. The cost of this mini- dairy is estimated to be less than $40,000 for equipment and building.

Given the sales and cost assumptions used in the analysis, based on a location near Saskatoon or Regina, such a plant would achieve a break-even level of sales under the least optimistic market scenario. Given the expected sales volume, the plant could provide part-time income for the owner/operator with good management skills. Further income, of course, would be derived primarily through milk production supplemented by sales of meat and breeding stock.

The feasibility of specific operations depends on the operator, proximity to market, and costs, which must be assessed by each entrepreneur before entering the business. To become commercially successful, a goat milk processor must overcome several obstacles such as:

(1) locating and adapting small scale equipment
(2) meeting regulations
(3) processing and sanitation requirements
(4) marketing and distribution requirements

Several recommendations are included whereby the obstacles facing development of the industry can be reduced. Current regulations should remain in effect, but guidelines should be established to interpret the regulations as they apply to small scale goat milk production and processing. To overcome the lack of commercial equipment and supplier services, it is recommended that a prototype mini-dairy be designed and constructed by faculty and students at the University of Saskatchewan. To provide assistance in the areas of process operation, sanitation, business administration, and marketing, we recommend a faculty/student project to prepare an instruction manual on the processing and marketing of goat's milk.

Introduction

The goat dairy industry in Saskatchewan has gradually developed over time, and has achieved a size that requires investigation to aid in future development of the industry. Harvest Foods Ltd. was requested by the Livestock Branch of Saskatchewan Agriculture to assess the market potential for goat milk and goat milk products, and the feasibility of establishing a goat dairy processing industry in Saskatchewan.

The following study has been designed to fulfill these requirements. It includes an assessment of the present industry, an evaluation of the market potential based on interviews and secondary data sources, and a review of processing options. Based on the market potential, and the practicality of processing options, a proposed commercial processing plant has been conceptualized. The feasibility of the plant is evaluated, and recommendations are put forward for action that will further the development of the industry.

1. AN OVERVIEW OF THE DAIRY GOAT INDUSTRY

1.1 The Dairy Goat Industry Worldwide

Of the world's total goat population of between 400 and 500 million, 95% are found in developing countries and only 5% in developed countries including the USSR. Of the total goat population in developing countries, 30% is found in Africa, 23% in India and Pakistan, 17% in mainland China, and 7% in Latin America. The remaining 23% is found primarily in Asia. The goat population compares with 1,212 million cattle and 1,083 million sheep worldwide.[13]

In general, goats and their marketing are of much greater importance in the developing than in the developed world (although, with only 5% of the goat population, the developed world accounts for 27% of milk production). On a worldwide basis, goats account (in terms of quantity) for about 6% of meat production, 4% of hides and skins produced, and 2% of milk production.[13] Meat and milk from goats account for a much higher percentage of the total meat and milk produced in less industrialized countries (3.5 and 5.1%) than in industrialized countries (0.2 and 0.6%).[12] Goats worldwide produce approximately 4.1 million tonnes of milk and 1.1 million tonnes of meat annually.[6]

More people consume milk and milk products from goats worldwide than from any other animal. More than 75% of the world's population drinks goat milk, which may also be made into cheeses, yogourt, and butter. The meat is recognized as a staple in many countries of the world, and is the only meat widely available in many mid-East countries.

Goat milk products are generally not well known in the most important industrialized countries like the U.S., Japan, and West Germany. For all practical purposes, goat meat is not consumed in these countries. In the core countries, beef, pork and poultry are the major meats and cow's milk is by far the major source of dairy products.

In some of the developed countries, however, a certain level of development has been achieved in the goat dairy industry, and goat milk diversifies the dairy products range. Choice, flavour, and specific qualities of goat products predominate over the strictly nutritional aspects. In France, Greece, Norway and Italy, cheese production is of economic importance. In the few countries where a goat dairy industry exists, its development is based on consumers' preference for goat milk products, which creates a specific market.

France provides a good example of countries with a specialized dairy goat and cheese industry. On average, 85% of the income from goats stems from milk and 15% from meat sales. Only 5% of the goat's milk is used for home consumption and 15% for feeding kids, while 80% is used for processing cheese. The production of cheese from goat's milk at about 31,800 tonnes ranks below that of cows' (909,090 tonnes) and above ewes' milk (16,300 tonnes). There are 145 dairies/cheese factories of which the larger ones process 10 to 20 million litres per year. Industrial milk collection amounts to 170 million litres per year, and cheese production to 20,900 tonnes per year. In addition, 10,900 tonnes of cheese are still processed by the producers themselves, who produce about 70 different varieties of soft cheese.[5]

Preconditions for developing a specialized intensive goat dairy industry, which can compete with bovine products are: (1) a specific market, where industrial quality products fetch a higher price than bovine products, (2) a volume of production sufficient to feed processing plants at conditions which ensure sufficient income, and (3) a sufficiently regular supply of the dairies throughout the year, despite the seasonality of milk production.

1.2 The United States

In the overall picture, "commercial goat dairying is a minor industry in the United States."[5] According to the latest census

figures available (1982), there are 166,018 dairy goats on 85,581 farms in the United States.[14] The industry is characterized by small herds and intensive feeding management on limited acreage.

Commercial U.S. goat milk production is limited. A 1981 survey located 81 state-licensed goat dairies which were producing and marketing fluid milk, milk products, cheese, evaporated milk, or powdered milk to retail markets. These ranged in size from two large evaporated/powdered goat milk processors which each handle approximately 1.35 to 1.8 million kilograms of goat milk per year, to many small producer-distributors which sell under 400 litres of milk a week, and often less than 200 litres a week. Less than 10 goat dairies derive their total income from the sale of goat milk and its products. On average, they milk approximately 40 does, retailing and wholesaling between 180 and 720 kg of goat milk per week.

Of the 81 state-licensed goat dairies surveyed in 1981, seventeen were producing goat cheese exclusively, two were producing evaporated and powdered goat milk, and the rest were marketing fluid milk as the main product, and in most cases as the only product.[7] A few were producing cheese, ice cream, yogourt, or other milk products. Sixteen of the fluid milk dairies were marketing Grade A pasteurized goat milk; the rest were marketing retail raw milk as their main product. Three of the raw milk dairies were also selling some pasteurized milk.

Among the 50 states, half do not have a single licensed goat dairy. Only a few of the larger cities are serviced by a dairy or dairies. As a result, it has been estimated that at least 70% of U.S. urban areas do not have fluid goat milk available in local retail outlets.[6,7]

Milk from a few dairies is sold through distributors and reaches a geographically wide market, but most of the fluid milk dairies distribute their own milk directly to retail outlets.

The most common type of commercial goat dairy in the U.S. is the full dairy, or producer/distributor type of operation: the goats are milked, the milk is processed and bottled or otherwise prepared for sale to consumers, and usually the dairyman makes deliveries to retail stores. Most goat dairies market only fluid milk; a few also produce yogourt, ice cream or other products.

In contrast to the full dairy operation, the dairy farm sells milk, in bulk, to a processing plant. The dairy farm is an operation which milks goats, and from there the milk is moved elsewhere for processing and packaging. While this is the normal way milk is sold by dairy cow producers, it is far less common among dairy goat producers. In the U.S., in 1981, there were only a half dozen processing plants which regularly purchase goat milk in bulk from farms. In addition, a few goat dairies that process their own milk also purchase from one or two other producing farms.

1.3 Canada

There do not appear to be any published overviews of the dairy goat industry in Canada as a whole. A study done for Agriculture Canada by Agriconsultants Ltd. in 1982 analysed the market for goat milk dairy products.[2] The study, published in French, concentrated primarily on Quebec, Ontario, Alberta and British Columbia. An evaluation of the market for goat milk cheese in British Columbia was completed in 1984 by the B.C. Ministry of Agriculture and Food.[10] Finally, Agriculture Canada in 1985 published a French language overview of the goat industry in Quebec.[8]

Without an overview of the dairy goat industry in Canada, it is possible to provide only a fragmentary picture of the industry, using information from various sources. As in the U.S., there are considerable differences in industry development from one part of the country to

another. Unlike the U.S., however, there seems to be more of an emphasis on custom processing of milk, with fewer producer/processor integrated operations.

Ontario

The greatest level of industry development in Canada occurs in Ontario. During 1985, Ontario goat producers supplied 2,345,000 litres of goat's milk to 11 plants licensed to manufacture goat's milk products, an average of 213,181 litres for each plant.[10] During 1983 and 1984, goat milk producers supplied 1,410 kilolitres and 2,242 kilolitres, respectively (see Table 1). This represents a 60% increase from 1983 to 1984, and a 5% increase from 1984 to 1985.

During 1985, 495,000 litres of goat's milk was used to manufacture whole, partly skimmed, and chocolate goat's milk. The Ontario goat milk industry also manufactures goat's milk yogourt, ice cream, and cheese. Goat's milk cheese production for 1985 was 97,000 kgs. The main varieties of goat's milk cheese manufactured were Feta, Gaisli, Casata, and goat cream cheese.

Currently, there are 100 goat milk producers licensed through the Dairy Inspection Branch of the Ontario Ministry of Agriculture and Food. The relative maturity of the Ontario industry is also indicated by the fact that Ontario has the largest goat population, the highest number of farms with goats, and the highest average number of goats per farm of any province (see Tables 3 and 4).

Quebec

The dairy goat industry in Quebec is also relatively advanced compared with most provinces. As of 1985, Quebec production of goat's milk was estimated to be 1,136,000 kg, produced by 45 farms with an

Table 1

Purchases of Goat's Milk by Dairy Plants in Ontario

Month	Litres				
	1981	1982	1983	1984	1985
January	31 448	29 966	46 572	80 513	--
February	34 199	30 644	45 230	94 237	--
March	57 666	39 935	104 409	153 252	--
April	83 931	46 673	127 944	186 951	--
May	89 840	44 704	156 260	249 509	--
June	82 999	62 964	189 075	267 919	--
July	81 292	63 578	145 443	276 628	--
August	71 880	55 352	132 962	256 765	--
September	73 215	48 479	114 342	187 132	--
October	55 311	45 616	127 442	172 020	--
November	45 690	37 744	118 283	174 889	--
December	42 894	38 801	102 075	141 913	--
TOTAL	750 365	554 456	1 410 037	2 241 728	2 345 000

Monthly Dairy Report. Volume 565A (March 1985) and Volume 578 (April 1986). Ontario Ministry of Agriculture and Food.

average of 50 goats per farm and average production of 500 kg per goat.[8] Goat milk production in Quebec has increased by approximately 262% since 1981.

The processing of goat's milk in Quebec is largely done by on-farm plants, and is considered to be a cottage industry. This is in contrast with the situation in Ontario, where processing is more industrial in nature. The number of licensed goat milk processors in Quebec has increased over recent years, and as of 1985 stood at 29 (see Table 2).

British Columbia

British Columbia is the most highly developed western province in terms of the dairy goat industry. According to a spokesman for the Ministry of Agriculture and Food, there are presently three commercial goat dairies in British Columbia. In all three cases, goat's milk is produced on several farms, collected, and taken to a dairy plant which normally processes cow's milk. The cost of building and operating a dairy plant solely for goat's milk has not proven feasible, although apparently several parties have tried.

Alberta

Alberta closely follows B.C. in the level of development of the dairy goat industry. There is one fluid milk dairy in Alberta which processes milk for retail sale. There are four producers who ship milk to the plant, which is located near Wetaskiwin. The plant processes 3300 lbs (i.e. 1485 kg or approximately 1442 litres) of fluid milk each week, as well as 225 kg of milk for yogourt production. Some cheese is also produced.[1]

There is also another operation which makes goat cheese, and is located near Rimbey. This plant is supplied by three processors.

Table 2

Number of Permits Granted to Plants in Quebec for Processing Goat Milk

Goat Milk Product	1981	1982	1983	1984	1985
Pasteurized Fluid Milk	3	4	6	8	12
Cheese	13	20	21	24	25
Yogourt	3	5	8	11	14
Butter	-	-	-	1	1
Skim Milk Powder	-	-	-	1	1
Ice Cream	-	-	-	1	1
TOTAL NUMBER OF LICENSED PLANTS	14	17	22	27	29

Manitoba

The situation in Manitoba is similar to that in Saskatchewan according to a government representative. Most of Manitoba's goat producers are small (5 to 15 milking does) hobby farms. Currently, one larger goat producer (75 milking does) is processing approximately 800 litres of milk per week at a dairy processing facility in Winnipeg. The producer delivers his milk to the plant and also delivers the finished product to the retail and health food stores. The Canadian Food Development Centre, Portage la Prairie, and the Food Science Department, University of Manitoba, have assisted the producer in establishing this venture. The producer and the processing plant have their own contract regarding payment for processing.

The Maritime Provinces

The goat milk industry in the Maritime provinces is relatively undeveloped. There is, however, some level of commercialization occurring in the region. In Prince Edward Island there is presently one goat milk supplier whose product is processed at a local plant once a week. The milk is packaged for sale in 500 ml and one litre Pure-Pak cartons. The volume of milk processed amounts to about 500 litres per week.

In Nova Scotia there is presently one producer with forty milking does who has her milk production processed and packaged once a week by a fluid milk plant, for which she pays a processing fee. The milk is packaged in plastic pouches, labelled, and sold in the Halifax market.

2. PRODUCER SURVEY

2.1 Size of the Industry in Saskatchewan

More than 50 persons were contacted through the Saskatchewan Goat Breeders Association and other sources. A number of these individuals were found not to be actively involved in keeping goats. Therefore, a total of 45 people were interviewed as part of the producer survey for the study, 8 in person and 37 by telephone. The interviews were based on a structured questionnaire, which is presented in Appendix 1. Many producers offered general comments as well as responses to specific questions, and these comments were also recorded.

Prior to the study, it was believed that approximately 100 producers exist in the province, based on the Saskatchewan Goat Breeders Association (SGBA) membership. Subsequent research, however, has revealed that the milk shed is much more diffuse than was believed.

This conclusion is based primarily on Statistics Canada Census data taken in 1961, 1971, and 1981. Table 3 indicates the number of goats on farms in each province in each of these years. For 1981, the total number of goats reported on Saskatchewan farms was 4,317. The total number of goats reported by the 45 producers interviewed, however, amounted to 954. This represents less than one-quarter of the total number of goats in 1981.

It is difficult to accurately identify trends in goat ownership, given that only three years are reported out of the last 25 years. This difficulty is compounded by the fact that the population of goats in Canada experienced a slight but significant decline from 1961 to 1971, followed by a dramatic increase in numbers from 1971 to 1981. This increase was in the order of over 500% for Canada as a whole, and almost 220% for Saskatchewan. It is reasonable to assume that the number of

Table 3. Distribution of Goats on Farms in Canada, by Province.

Province	Number of Goats			Number of Farms		
	1961	1971	1981	1961	1971	1981
Newfoundland	135	259	296	47	21	31
Prince Edward Island	75	48	348	46	40	65
Nova Scotia	388	252	1,405	142	93	224
New Brunswick	272	54	816	105	34	126
Quebec	3,672	2,620	13,111	1,488	394	1,252
Ontario	7,495	7,127	45,500	2,253	1,532	4,212
Manitoba	1,051	777	4,684	433	303	581
Saskatchewan	2,657	1,971	4,317	992	770	961
Alberta	4,717	2,663	10,567	1,669	906	1,542
British Columbia	3,027	2,068	8,795	589	435	1,132
CANADA Total[1]	23,492	17,841	89,389	7,764	4,529	10,127

[1] includes Yukon and N.W.T.

Source: Statistics Canada, Census of Agriculture

goats in the province has increased in the 5 years since the 1981 census, given the strength of the trend from 1971 to 1981. Furthermore, many of the producers interviewed volunteered the opinion that goat ownership is on the upswing. If it is assumed that the growth has continued at the same rate as from 1971 to 1981 (i.e. compound annual growth rate of 8.16%), then the population of goats in Saskatchewan is presently about 6390 animals.

The numbers of farms reporting goats in the three census years in each province are presented in Table 3. It is particularly of interest to note the large number of farms reporting goats in each case. In Saskatchewan in 1981 there were almost 1000 farms reporting goats. Table 4 presents the average number of goats per farm in each province. In 1961, 1971, and 1981, respectively, Saskatchewan had 2.7, 2.6, and 4.5 goats per farm, on average. The figure for 1981 is the lowest for all the provinces, indicating the diffuse nature of the milk shed in Saskatchewan. The larger average goat herd size in Ontario, Quebec and British Columbia are probably due largely to the more extensive development of commercial dairy goat operations in those provinces. Quebec and Ontario, in fact, averaged more than twice the number of goats per farm than Saskatchewan, indicating the potential for commercial development in Saskatchewan.

While the Saskatchewan goat population for 1986 is unknown, as is the number of farms with goats in 1986, it is reasonable to assume that the 45 producers interviewed represent only a small percentage (almost certainly less than 5%) of the goat owners in the province.

Again, this conclusion was supported by the producer interviews. When asked whether they knew of any other producers in their area, many of these interviewed indicated that they were aware of many people owning just one or two goats. The respondents were usually not aware of the names of these other goat owners. It is interesting to note that some

Table 4

Average Number of Goats per Farm in Canada, by Province

Province	1961	1971	1981
Newfoundland	2.9	12.3	9.5
Prince Edward Island	1.6	1.2	5.6
Nova Scotia	2.7	2.7	6.3
New Brunswick	2.6	1.6	6.5
Quebec	2.5	6.7	10.5
Ontario	3.3	4.7	10.8
Manitoba	2.4	2.6	8.1
Saskatchewan	2.7	2.6	4.5
Alberta	2.8	2.9	6.9
British Columbia	5.1	4.8	7.8
CANADA TOTAL[1]	3.0	3.9	8.8

[1] includes Yukon and N.W.T.

Source: Statistics Canada Census of Agriculture.

producers reported selling goats to some of their customers, such customers being interested in producing just enough milk for their own needs. Usually these customers keep a goat or two because someone in the family is allergic to cow's milk, or because they want a pet.

The intention of the survey was to interview the major producers in the province. It is apparent that all, or almost all, of the major producers in the province were among the 45 interviewed. The names of a handful of individuals were cited repeatedly by respondents as being influential in the industry, and all of these individuals were contacted. It is possible that a few individuals who might be considered major producers were not interviewed. Such individuals were either not members of the Saskatchewan Goat Breeders Association and were not known by the other goat producers in their area, or they were simply unable to be contacted. Among the 45 respondents, of course, were many who are not major producers and have no intention of becoming such.

The fact that the 45 respondents collectively owned a total of 954 goats indicates the preponderance of major producers among them. This figure represents an average of 21.2 goats per farm, far in excess of the 4.5 goats per farm reported for all Saskatchewan farms in 1981. The distribution of number of goats per producer for the 45 producers interviewed is presented in Table 5. Compared with the size of commercial goat dairy herds in other parts of Canada and the U.S., it is interesting to note that almost three-quarters (73.3%) of the producers interviewed had only 20 goats or fewer.

It may be a justifiable assumption to identify major producers as those with herds totalling over 20 animals (in this case 26.6% of the producers interviewed). However, it may be overly simplistic to identify major producers on the basis of herd size alone. In some cases the owner

Table 5. The Distribution of Goats Among Producers Interviewed.

	Number of Goats							
	1-5	6-10	11-20	21-30	31-40	41-50	51-60	>60
No. of Producers	9	13	11	4	2	1	2	3
% of Total	20.0	28.9	24.4	8.9	4.4	2.2	4.4	6.7

of a large herd may not be managing the herd intensively, milking only a few animals and using the milk for home use and for raising other livestock. On the other hand, a producer with fewer than 20 animals may be milking most of these, making extensive farm-gate milk sales, in possession of more elaborate facilities, and planning for future expansion.

2.2 Location of the Milk Shed

Given the large number of producers in the province (probably in excess of 1000) and the fact that most of these keep a maximum of one or two goats, it is extremely difficult to accurately determine the location of the entire milk shed for goats in the province. However, given that the respondents include the major producers in the province, and thus represent the potential pool of milk for commercial processing, the location and relative herd sizes of these producers was used to indicate the location of the milk shed.

Figure 1 illustrates the location of the milk shed in Saskatchewan, based on producer interviews. It is obvious that the highest concentrations of producers in Saskatchewan are in proximity to the major urban centres. A considerable number of producers, however, are located some distance from these urban centres, indicating the diffuse nature of the milk shed in the province. The implications of this vis-à-vis central processing facilities will be discussed in a later section.

2.3 Milk Supply

It is difficult to gain an indication of the milk supply available through the milk shed in Saskatchewan. This is primarily due to the fact

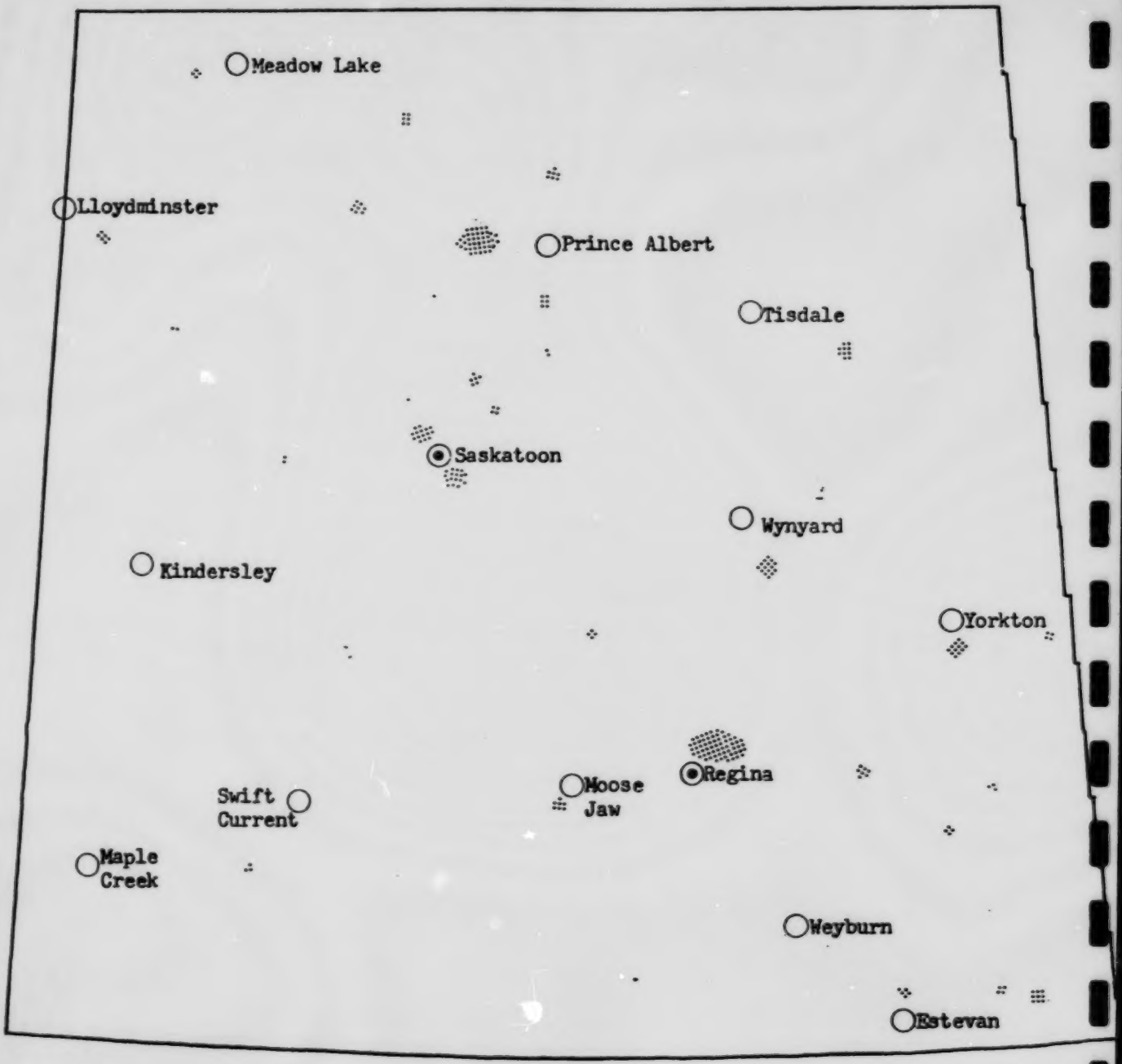

Figure 1. Location of the Dairy Goat Milk Shed in Saskatchewan.

(Each dot represents one milking doe at the time of the survey.)

that goats are seasonal breeders by nature. This means that consistent production volumes are only possible if a high level of management is employed to manipulate breeding seasons of animals to ensure year round production. These management techniques are just beginning to be applied by Saskatchewan producers, since the need for a year round consistent supply of raw milk has been minimal to this point.

The gestation period for goats is approximately five months long. After breeding, if conception occurs, the milking doe will gradually decrease her milk production, particularly if the timing coincides with the onset of colder weather and drier forages. Normally, after three months of milking, the doe's yield is small. Two months before the doe is to kid, she must be dried off, since the strain of producing milk and nourishing her unborn young can cause health problems and will usually affect milk production in the next lactation.

Because of the seasonally polyestrous nature of goats, most kids will be naturally dropped in December or January. Hence there will be a great deal of milk being produced from February until September, and a very low production in late fall and early winter.

Another complication in gaining an indication of the milk supply using the producer interviews is the highly variable nature of that supply due to other factors. Producers appear to be constantly varying the size of their milking herds. Many indicated that they were in the process of "culling" less productive milking does. Others had just purchased does and had not had a chance to assess their productive capacity. A few were unsure of the production volume, since they were simply feeding most of the milk to other livestock or raising kids on it. Finally, because the producers were interviewed during late August and early September, many of them indicated that they were just in the process of drying off some of their does.

Because of the seasonal nature of milk production, therefore, it is difficult to assess the potential milk supply. While seasonality can be accounted for, in theory, the practical difficulties of doing so given the volatile nature of goat herd size further complicate the issue. Therefore, the results of a survey such as this must be interpreted with caution.

Most producers were able to provide at least a rough estimate of the level of production at the time of the survey. For a summary of the results, see Table 6. Of the three individuals reporting no milk production at the time of the survey, one indicated that she had just received her first goat and hadn't begun milking yet. The other two had cut back on milking animals due to health reasons in the family. Of those who were actually able to provide a usable figure for milk production, the largest single group were those whose operations produced between six and ten litres per day. Almost half (46.5%) of producers were producing 10 or fewer litres per day. There appears to be a large gap between the large volume producers and the small volume operations. All but two producers produced 40 or fewer litres per day. The two exceptions, on the other hand, produced over 90 litres per day. Another producer, who only provided peak summer production levels, was probably approaching a total of 90 litres per day at the time of the survey.

It would appear, therefore, that there are only 3 producers in the province at the present time who are approaching a volume of 100 litres per day on average. These three producers are all beginning to apply management techniques to remove the seasonality from their production. Nevertheless, peak production levels may exceed those reported at the time of the interview by anywhere from 20% to 100%. Of the 9 producers who provided a comparison between peak production and that at the time of the interview, most indicated that peak production would exceed the present volume by 50%.

Table 6. Raw Milk Production Volumes for Individual Producers in August-September, 1986 (in litres/day).

	None	1-5	6-10	11-15	16-20	21-25	26-30	31-40	41-90	91-100	No Response
No. of Producers	3	5	8	5	3	1	2	3	0	2	13
% of Total Respondents	6.7	11.1	17.8	11.1	6.7	2.2	4.4	6.6	0	4.4	28.9
% of Respondents Reporting Milk Production	N/A	17.2	27.6	17.2	10.3	3.4	6.9	10.3	0	6.9	N/A

The total milk production at the time of the survey for the 29 producers who provided an estimate amounted to 580.4 l/day, or 211,846 l/year. This represents approximately 0.1% of the production in the cattle dairy industry for the 766 producers operating in 1985. Their output was 203,294,363 kg of cow's milk.

Suzanne Bishop of the Canadian Goat Society indicated that a total of eight milk goat herds in Saskatchewan are now on test with the DHAS (Dairy Herd Analysis Service) at Macdonald College in Quebec. Testing occurs at monthly intervals. The milk of all the does milking in each test herd is weighed at two consecutive milkings and recorded on special computer forms. Production for individual does is recorded, projections made for the total lactation, and ratings calculated for each animal in comparison to the other animals in the herd.

Since Saskatchewan herds have been on test for less than a year, an actual yearly production figure for these herds is not available. Suzanne Bishop, however, indicates that a rough projection of total milk production for all eight DHAS tested herds in Saskatchewan for 1986 would be 74,937 kgs of milk (approximately 72,776 litres). This is an average of 688 kg per doe. Because this is the first year on test for these herdowners, it would be reasonable to assume that they will use their milk record as the management tool that it is and cull and select their animals. This should result in an expectation of a higher average of records gradually in future years to bring Saskatchewan records in line with the higher national average.

2.4 Date of Entry into the Industry

Each of the producers interviewed was asked how long they had been involved in raising goats, in order to gain an indication of the growth of the industry. The results are summarized in Table 7. The fact that over half (55.6%) of the respondents entered the industry within the last 5 years, and that only 11.1% have been involved for more than 10 years, indicates a substantial rate of entry into the industry.

Table 7. Date of Entry Into the Industry.

	1 year ago or less	2-5 yrs	6-10 yrs	11-15 yrs
Number of Producers	8	17	15	5
% of Total	17.8	37.8	33.3	11.1

To quantitatively assess the growth of the industry, of course, would require an evaluation of the rate of exit from the industry. This would allow a measurement of the turnover rate in goat-keeping, the residual representing the net industry growth. Unfortunately, however, a measure of the rate of exit from the industry is not available, since there are no detailed records of individual involvement in the industry over time. This, of course, is due to the fact that it is very diffuse and largely unregulated. However, the substantial growth in the number of goats reported from Saskatchean farms between 1971 and 1981 is also indicative of a growth trend in the industry.

2.5 Producer Expansion Potential

2.5.1 Desire of Producers to Expand

An indication of the potential for growth in the industry is indicated by the desire of producers to expand the size of their herds. The producers surveyed were asked about their desire to expand. The results of the survey are presented in Table 8. Over half of the respondents (53.3%) stated a desire to expand the size of their herds, while another 6.6% expressed a desire to expand, but were unable to at the time of the survey. These individuals were limited by the size of their property in two of the three cases. Another 6.6% were unsure as to

whether or not they would be interested in expanding, being cautious about the stability of demand.

Of the 15 producers who were not interested in expanding, 4 indicated that they simply wanted to produce enough milk for home use. Three others said that they were keeping goats simply as a hobby, and another two indicated that they were retired and had no interest in expanding. The remainder said that they were too busy farming (3), working (2), or both (1), to consider expanding the size of their herd.

As a related question, producers were asked whether or not they would be interested in supplying milk to a processor for pasteurization and other processing. The results are presented in Table 9. While 68.9% responded in the affirmative, there was a general acknowledgement among many respondents, particularly those removed from major centres, that the shipping of small quantities of raw milk long distances would probably be unfeasible. Therefore, a centralized processing plant would be of little practical concern to many potential suppliers in the province.

This leads to the consideration of another processing option, that of the possibility of small-scale on farm pasteurization plants. While the feasibility of such an option was as yet unknown, it was considered worthwhile to ask producers if they would consider a plant on their farm. A total of 10 respondents (22.2% of the total) indicated that they would seriously consider establishing a processing plant on their farm. Again, these respondents acknowledged the practical difficulties of such an option. These included the capital costs of plant and equipment (which is in turn affected by the regulatory structure of the processing industry), and the difficulty of obtaining processing equipment of a suitable scale.

Interest in on-farm processing appears to be very high. Of the 10 respondents considering such an option, a number have actively been seeking suppliers of suitable equipment. Furthermore, two producers are presently building sizeable new dairy goat barns, and are doing so in such a way as to allow for the future addition of processing facilities.

Table 8. Desire of Producers to Expand.

	Desire to Expand	Interested, But Unable to at Present	Not Interested	Unsure
Number of Respondents	24	3	15	3
% of Total	53.3	6.6	33.3	6.6

Table 9. Interest of Producers in Supplying Milk to a Processor.

	Desire to Expand	Interested, But Unable to at Present	Not Interested	Unsure
Number of Respondents	31	1	8	5
% of Total	68.9	2.2	17.8	11.1

2.5.2 Producer Estimate of Minimum Viable Herd Size

Producers interviewed were asked what they considered to be the minimum viable herd size for a commercial dairy goat operation. As with the questions regarding the willingness to supply a processor, and the price at which they would do so, respondents greeted this question with considerable uncertainty. Many of the respondents (25, or 55.5%) stated that they were simply not sure. The results of this question are presented in Table 10. Some of the respondents replied with a single number, while others gave a range of the number of animals required, making tabulation of the results somewhat complicated. The results, therefore are divided into ranges of the number of animals considered to be the minimum viable herd size. Note that these numbers represent the number of does being milked at any given time. The actual size of the total herd, therefore, would be larger, and would include dry or nursing does, bucks, and kids.

Table 10. Producer Estimate of Minimum Viable Herd Size (minimum number of does milking).

	10-15	15-20	21-30	31-40	41-50	51-75	Unsure
Number of Respondents	2	8	3	3	2	2	25
% of Total	4.4	17.8	6.6	6.6	4.4	4.4	55.5

2.5.3 Producer Estimate of Minimum Price

Producers surveyed were asked what the approximate minimum price would be for them to consider supplying to a processing plant. Most respondents were very uncertain as to what this figure might be. Many of

them indicated that they were not only unsure of their present production costs, but realized that their present facilities would have to be upgraded to allow for commercial milk production, making their costs even more uncertain. Therefore, only eight respondents, or approximately 18%, ventured an estimate of the minimum acceptable cost. Their estimates ranged from $0.65/litre to $1.10/litre. The average of these estimates was $0.82/litre.

2.6 Meat Sales

Sales of goats for meat represent another source of income for goat milk producers. While the focus of this study is specifically on the production and marketing of goat milk and milk products, producers were also asked about their sales of meat animals. Such sources of income must be considered when assessing the economics of the goat dairy industry .

Fifteen of the respondents (33%) indicated that they sold goat meat at the farm gate. Producers indicated that most of these sales were to members of various ethnic communities, primarily urban residents. These communities included Greek, Indo-Pakistani and Caribbean ethnic groups.

There are often certain religious rituals which are prescribed by a particular ethnic group regarding the killing or butchering of goats. Some of the goat producers had difficulty accepting such practices, and as a result chose not to sell animals at the farm gate, or insisted on doing the killing and butchering themselves.

Sales to the ethnic community consist mainly of kids, and are seasonal, being based on religious celebrations and events. Those producers situated close to large urban areas tend to have the largest market, due to the higher concentration of ethnic groups in the cities. Meat animals tend to fetch higher prices when sold at the farm gate

compared to selling through auctions. Farm gate prices were generally $1.00 per pound (2.20/kg) live, or $2.50 per pound (5.50/kg) cut and wrapped.

Nine of the respondents (20%) occasionally sell goats through auction marts. A common complaint was that animals sold through the auction received a very low price. One producer indicated that she received only $7.00 to $22.00 per animal at auction, the lower figure being barely enough to cover the costs of gasoline and the selling fee.

Eight respondents (18%) indicated that they either shipped meat animals out of province for sale in larger centres, or transported them to another producer situated close to an urban centre. The latter individual then sold the animals to customers through farm-gate sales. Apparently, the price differential between this option and selling at auction was sufficient to induce these producers to transport their goats.

A complaint commonly heard from respondents is that the market for goat meat is highly disorganized. They believe that a significant market for goat meat exists in Saskatchewan, particularly in the urban centres. However, the lack of interest on the part of meat processors and meat inspectors has retarded the development of this market.

Goats sold for meat generally represent surplus stock being culled by goat producers. Most of these, of course, are male kids, since only one or two bucks are generally kept in most herds. Occasionally, a milk doe of lower quality will be culled as well.

2.7 Sales of Breeding Stock

As with meat sales, the sale of breeding stock represents another potential source of income for goat milk producers. It was suggested by several producers that when the production of milk is the primary purpose of a goat herd owner, then the showing and selling should be left

primarily to those for whom it represents their main purpose. Nevertheless, the sale of breeding stock is of great interest to most goat milk producers, and may represent a significant portion of income.

A total of 19 respondents (42%) are involved in the sale of breeding stock to some extent. This is another area where producers voiced several complaints. Some felt that there was not enough assistance to goat breeders or agricultural fairs to encourage the development of professionally judged goat shows in Saskatchewan. It was suggested that breeders of cattle, for example, receive a subsidy to help defray the costs of transporting animals to shows, but that such subsidies were not available to goat breeders. It was also mentioned that, in Alberta, agricultural fairs can receive a government subsidy to help defray the costs of bringing in professional judges for goat shows.

In conclusion, it was suggested that the development of the goat industry in Saskatchewan is highly dependent on increasing both the genetic quality and the public profile of goats. The showing and selling of breeding stock is one of the most important avenues for achieving this goal. Also, to reiterate, sales of breeding stock do represent another source of income to goat milk producers.

2.8 Producer Assistance

As a final question in the survey, producers were asked to identify the types of assistance (if any) which they felt were most needed from the government. The results of this question are summarized in Table 11.

It is apparent from the results of the survey that producers generally recognize the need for market development if the dairy goat industry is to develop to any extent. Many producers indicated that goats in general, and goat products, have an unjustified negative image in the eyes of the public. The most commonly identified need, as a

result, was for government assistance in what can be considered market development. This may include advertising, publicity through the news media, and public awareness through such things as brochures for physicians, allergists, retailers, and the general public.

The second most cited need for government services can be described as financial assistance for establishing processing facilities. Suggestions for financing included venture capital, interest free loans, and subsidies. An associated need was for financial assistance to producers in order for them to upgrade and expand their facilities.

Thirteen percent of producers identified a need for improvements in the system for marketing goat meat. Such suggestions are based on the difficulties of getting the animals to the proper markets and receiving a reasonable price, as discussed previously. Farm gate sales, while generally resulting in acceptable prices, are difficult to achieve for producers located some distance from urban centres. Even for those producers near urban markets such sales are often inconvenient, and present difficulties in accommodating the religious practices of the ethnic groups which comprise the major market. Unfortunately, the prices received at auction are usually very low, as previously discussed. The need for further research into this area is apparent.

A significant number of respondents indicated the need for regulatory changes to enhance the development of the industry. Three such producers felt that processing regulations, which were designed primarily for the cattle dairy industry, placed an onerous burden on potential goat milk processors. While recognizing the need to maintain health standards, these producers felt that regulations specifically designed for the processing and handling of goats' milk would be necessary to make processing feasible.

A number of needs identified were associated with what could be called extension services. These included a need for more information

resource material from Saskatchewan Agriculture, creating a position for a goat specialist in the department, developing breeding programs for herd improvement, and improving herd health guidelines. Developing an increased presence for goats at agricultural exhibitions is related to this category, and was discussed in greater detail in the previous section of the report.

Finally, although only one producer specifically identified a need for greater recognition of the industry by government, this need was implied by a far greater number of respondents. The majority of the producers interviewed responded very positively to the survey, and many clearly stated that it was very encouraging to see the industry getting some attention in the form of the study. A general impression gained through the literature and other sources is that goat owners do not take the industry seriously, and in a professional and business-like manner. They are perceived primarily as hobbyists. This, however, may be begging the issue. Until goat producers are treated as more than hobbyists by government in general, and are provided with the information, technical assistance and support necessary to advance the industry, they will be forced into retaining the status of hobbyists.

Table 11. Types of Government Services Needed, as Identified by Producers Surveyed.

	Type of Service	Number of Producers	% of Producers
1.	Market Development (advertising, publicity, public awareness)	20	44.4
2.	Financial assistance for establishing processing facilities)	9	20.0
	- Venture financing	(1)	(2.2)
	- Interest free loans	(2)	(4.4)
	- Subsidies	(2)	(4.4)
	- General financial assistance	(4)	(8.9)
3.	Improvements in the system for marketing goat meat	6	13.3
4.	Government technical assistance and information sources	6	13.3
	- more resource material from Saskatchewan Agriculture	(4)	(8.9)
	- a goat specialist at Saskatchewan Agriculture	(2)	(4.4)
5.	Legislative and regulatory reform	5	11.1
	- processing regulations specific to goat milk	(3)	(6.7)
	- establishment of certified farms	(2)	(4.4)
6.	Financial assistance for producers	3	6.7
	- support for milk herd testing	(2)	(4.4)
	- assistance re: cost of financing and facilities	(1)	(2.2)
7.	Assistance with herd improvement	3	6.7
	- development of breeding programs (as for cattle)	(1)	(2.2)
	- development of an artificial insemination program	(1)	(2.2)
	- facilitating the process of obtaining frozen semen from U.S.	(1)	(2.2)

Table 11 (continued)

Type of Service	Number of Producers	% of Producers
8. Assistance with herd health improvement	2	4.4
- develop herd health guidelines for veterinarians	(1)	(2.2)
- provide training and workshops for veterinarians	(1)	(2.2)
9. Increased profile for goats at agricultural exhibitions	2	4.4
- subsidize travel expenses of judges to shows	(1)	(2.2)
- subsidize transport of animals to shows	(1)	(2.2)
10. Greater recognition of goat industry by government	1	2.2

3. MARKET SURVEY

3.1 Farm-Gate Sales

3.1.1 Structure

Because milk producers are precluded by regulations from selling raw milk through retail outlets, the major market for fresh goat milk in Saskatchewan is farm-gate sales. Of the 45 producers interviewed, 20 (44.4%) do not sell milk at the farm gate. Milk is used for home consumption, given to friends and relatives, or used to raise other livestock (e.g. feeder calves, lambs, hogs, poultry). Most of those who do not sell milk are in locations which are quite distant from major urban centres. Several have sold milk in the past but have had their one or two customers move or find another producer in closer proximity.

Of the 25 who do sell milk, virtually all of it is sold at the farm gate to individual buyers. Ten of these producers (22.2%) sell the milk pasteurized. Two of these individuals pasteurize the milk using a microwave oven, while the remainder use 2 gallon (9 litre) home pasteurizers. Sixteen producers (35.5%) sell raw milk at the farm gate, while one producer (2.2%) sells both raw and pasteurized milk according to customer preference.

Producers were asked to estimate their average weekly sales of milk at the farm gate. Several indicated that their sales were so sporadic that they could not provide such a figure. Eight producers of pasteurized milk and twelve producers of raw milk provided estimates of their average weekly sales of milk at the farm gate, as illustrated in Table 12. Those who sell pasteurized milk generally appear to sell higher volumes on average, perhaps indicating a more serious approach overall to the industry. However, the average weekly sales for all producers of pasteurized milk is pulled up sharply by the weekly sales of

Table 12. Average Weekly Sales of Milk at the Farm-Gate.

	Pasteurized (litres/week)		Raw (litres/week)		Total (litres/week)
	2.8		4.5		
	16.0		4.5		
	28-35*		9.1		
	30.0		10.0		
	45.5		12.5		
	63.7		13.6		
	95.5		18.2		
	280-315*		22.7		
			30.0		
			80.0		
			127.3		
			140.0		
TOTAL	582.4		472.8		1,055.2
Average (8 producers)	72.8	Average (12 producers)	39.4	Average (20 producers)	52.76

*to determine the average weekly sales for all producers, median values were substituted for ranges.

one producer in particular, whose sales are three times those of the next largest pasteurized milk producer, and more than twice those of the largest raw milk producer.

3.1.2 Pricing

Producers were also asked what price they charge for their farm-gate milk sales. The results are presented in Table 13. As would be expected there was a considerable range of prices for both pasteurized and raw milk, but the average price for pasteurized milk is predictably higher.

A number of general comments were made by producers during the interviews, which emphasize the difficulty of relying on farm-gate sales. To begin with, most sales contacts are made by word-of-mouth, although some producers do inform physicians, including pediatricians and allergists, of their ability to supply goat milk. Almost all of the sales of fluid milk are to families with children or infants allergic to cow's milk. Making these people aware of the source of goat milk is very difficult to do, and so producers generally are dependent on word-of-mouth contacts or referrals by physicians.

Producers further commented that their sales tended to drop in the summer months, when their milk production was at its highest. This appears to be a result of two primary factors. Families whose children suffer allergies to cow's milk, and who thus constitute the greatest market, are on vacation during the summer. Secondly, such families will often purchase milk during the summer from producers with only one or two milking does. Such producers may have an excess of milk during the summer, and are willing to sell it at prices below those charged by the larger producers. Once fall returns, these customers once again begin to patronize their "regular" suppliers, who themselves are beginning to experience milk shortages as their does dry up. These producers,

Table 13. Selling Price of Milk at the Farm-Gate.

	Pasteurized ($/litre)	Raw ($/litre)
	1.00	0.88
	1.00	0.88
	1.10	1.10
	1.10	1.10
	1.25	1.10
	1.25	1.10
	1.25	1.15
	1.25	1.25
	1.32	1.25
	1.50	1.25
	1.80	1.25
		1.25
Average (10 producers)	$1.26/l	1.25
		1.32
		1.54
	Average (13 producers)	$1.18/l

therefore, are left with excess milk in the summer and experience excess demand in the winter. To cope with this excess demand they may sell frozen milk, or even resort to rationing their customers or referring them to other producers.

Only one example was encountered of an alternative market for goat's milk. Two producers interviewed were selling raw milk to a hospital which then pasteurized the milk for child patients who were allergic to cow's milk. These sales tended to be sporadic, but brought a price of $2.20 per litre, twice what the producers were receiving from their farm-gate sales to individual customers.

A number of producers appear to be involved in the production of other goat milk dairy products. Most of this is for home use, but some farm-gate sales are also made. Cheese appears to be the most commonly made product, followed by butter and yogourt. Generally, sales of these products were of a very small volume, and tended to be quite sporadic (although one producer estimated cheese sales of $400.00/week). The extent of dairy product production is illustrated in Table 14. Note that all sales of these products were made at the farm gate.

3.1.3 Sales Per Capita

The results of the producer interviews were analyzed to provide a basis for estimating the potential size of the market for goat milk in Saskatchewan. The data from producer interviews regarding farm-gate sales in different provincial centres was combined with population statistics to indicate weekly average sales per 1,000 population, as shown in Table 15.

It is obvious from Table 15 that there is a great deal of variation in the reported level of farm gate sales in each centre. Sales in the Prince Albert area, for example, are extremely high. Those for

Table 14. Production and Sale of Goat Milk Dairy Products by Producers.

	Number of Producers	% of Total Respondents
Cheese		
Home Consumption	19	42.2
Farm Gate Sales	5	11.1
Yogurt		
Home Consumption	8	17.7
Farm Gate Sales	0	0
Butter		
Home Consumption	10	22.2
Farm Gate Sales	2	4.4
Ice Cream		
Home Consumption	6	13.3
Farm Gate Sales	2	4.4
Cottage Cheese		
Home Consumption	4	8.8
Farm Gate Sales	2	4.4

Table 15. Average Weekly Farm Gate Sales of Goat Milk by Population for Provincial Centers

Center	Average Sales (l/week)	Population[1] (1985 figures)	Sales (litres per 1,000 population per week)
Saskatoon	162.1	175,859	0.922
Regina/Moose Jaw	285.5	210,684	1.355
Prince Albert	423.0	33,540	12.612
Estevan	107.3	10,214	10.505
Yorkton	71.5	16,055	4.453
TOTAL	1,049.4	446,352	2.351

[1]Source: Saskatchewan Health Services Plan

Saskatoon, on the other hand, are less dramatic. Generally, the smaller cities appear to have the highest sales levels per thousand population. However, it is important to remember that these sales figures are based on interviews with relatively few individual producers. The presence of only two or three relatively major producers in the smaller centres may indicate that a more complete assessment of sales in these areas was made possible. In the case of the larger centers, however, particularly Saskatoon, the population may be served by a larger number of producers, only a small fraction of whom were able to be interviewed. Therefore, it is reasonable to assume that the average weekly sales of goat milk in the Saskatoon and Regina areas is underestimated relative to the smaller centres.

In order to minimize the influence of such differences, it is possible to determine the weekly sales of milk per thousand population for the urban centres as an aggregate using the total average weekly sales for producers adjacent to these centres (1049.4 l), and their total population (446,352). This results in average weekly farm gate sales of 2.35 litres per thousand population.

3.2 Retail Sales

3.2.1 Health Food Stores

As part of the assessment of market potential for goat milk sales in Saskatchewan, a total of nine health food stores in urban centres were surveyed. The survey was based on a standard questionnaire, which is presented in Appendix 2. Unfortunately, supermarket stores in Saskatchewan have no experience selling goat's milk and they could provide little meaningful information. Therefore, the market survey was basically confined to health food stores and greater emphasis was placed on other parts of the study.

Products

All of the health food stores surveyed carried either canned evaporated goat milk (1 store), powdered goat milk (1 store), or both (7 stores). The evaporated milk was supplied primarily by Miracle, a California processor. Retail prices for Miracle evaporated goat milk ranged from $2.95 to 3.45 per 369 ml can among those retailers who specified a price. The powdered goat milk was supplied primarily by Meyenberg, a processor located in Arkansas. Retail prices among respondents ranged from $10.95 to $13.71 per 400 gm package. Prices of these products are quite high, reflecting the level of processing required and the costs of importing them from the U.S.

Most of the respondents were unable to give an estimate of the volume of sales for each of these products, but all of them indicated that the stock turnover was extremely slow. One of the stores indicated that only about 2 dozen cans of evaporated milk would be sold every six months, another estimated sales of 48 cans every six months. The latter store estimated powdered milk sales of 2 dozen packages every 6 months, while another estimated only 6 packages every 6 months. Respondents indicated that most of these products were sold to parents of children who are allergic to cow's milk.

Two stores sold goat milk cheese. One of these stores had just received their first order of cheese, consisting of cream cheese and feta cheese. The other carried four types of goat milk cheese: cream cheese, soft cheese, a colby-style hard cheese, and feta. The first three cheeses retailed for a price of $17.00/kg. The latter store was the only one which carried goat milk yogourt. This was a product of the Mystic Lake Dairy of Redmond, Washington, and was distributed by a Vancouver company. The yogourt was sold in 32 oz. containers, retailing for $4.00 per container. The estimated sales volume was 4-6 containers per week.

Potential for Retail Sales

Of the nine stores surveyed, only two indicated a definite interest in selling fluid goat's milk and other Saskatchewan produced goat milk products. Two other stores indicated that they might be interested. The remainder of the stores indicated that they do not have the refrigerator space or turnover rate to handle such a perishable item as fluid goat milk or other fresh dairy products. These stores indicated that they primarily carried such relatively nonperishable items as vitamins, herbs, food supplements, etc.

This is an important point which should be carefully considered when assessing the potential market and possible distribution alternatives for goat milk. Health food stores may seem to be a logical outlet for selling goat milk dairy products, due to the nature of their clientele and their flexibility compared to that of large chain supermarkets. However, their limited capacity for handling such perishable items as goat milk suggests that their usefulness as a distribution outlet may be minimal.

In spite of their inability to handle fluid goat milk, the managers of most of these stores (6 out of 9) felt that there was considerable potential for goat milk sales in the province. These six stores all indicated that they receive inquiries from people seeking a supply of fresh goat milk. One producer indicated that such inquiries have been increasing rapidly over the past few years. Another commented that people who have allergy problems, or who have children with allergy problems, have to go to a lot of trouble to obtain fresh goat milk. Another retailer felt that most potential customers have to find a supply of goat milk through a "network" of physicians and producers. Some of the stores indicated that they will often direct customers to specific goat milk producers for farm-gate sales.

When asked what price they felt that goat milk should retail for, most retailers answered that they were unfamiliar with the product, and so were unable to provide a price. The two respondents who gave a definite answer both felt that goat milk should retail for approximately $1.90 per litre.

Finally, health food stores surveyed were asked whether the greater market potential was for raw milk, or for pasteurized milk. Of the eight which responded to the question, four were not sure. Two indicated that either would be fine, since those seeking the milk because of allergy problems needed goat milk of any kind. Two retailers felt that the greatest demand was for raw milk, based on the preferences of their customers who are largely health food devotees.

3.3 Extent of Market Development

3.3.1 Per Capita Consumption

The consultants were able to find only minimal dairy goat data which contained direct relevance to developing commercial operations, a problem also reported by consultants studying the feasibility of commercial dairy goat operations in the southern U.S. and other provinces.

Marketing information was particularly rare and unreliable. A latent market for approximately one litre of fluid milk per week per 1,000 people in a metropolitan area was quoted often in interviews with dairy goat producers as existing generally (which was also the case reported by U.S. researchers) This figure appears to be based on survey data reported in 1982 by Judy Kapture for the U.S., which appears to support a statistic of one U.S. quart (0.947 l) of goat milk per week per 1,000 population as typical for a dairy distributing through retail outlets.[7] The best sales in metropolitan areas have been 4 qts (3.788 l) per week per 1,000 population, but such sales volumes are unusually high. In the majority of cases the reported maximum weekly sales were very close to the 1 qt (0.947 l) per week per 1,000 level, according to Kapture.

There are a number of factors which can result in deviations from this figure, as Kapture outlined. The highest per capita goat milk sales in the U.S. tend to be in the very smallest towns, where goat milk is available in the only grocery store in town; therefore, a very high proportion of the population is aware that goat milk is available. Sales are higher in areas which contain a higher than average proportion of elderly persons. Sales are also higher in those areas which show a strong interest in health and natural foods, reflected by the number of health food stores in operation.[7]

Judy Kapture, who is considered by many in the dairy goat industry in the U.S. to be an authority on goat milk markets, was interviewed by telephone during the course of the study. She indicated that she did not believe that any studies of the goat milk market in the U.S. had been done since the publication of her article in 1982. Kent Leach, the editor of the Dairy Goat Journal, a U.S. periodical, also indicated in a telephone interview that there was a shortage of studies of the market for dairy goat milk products in the U.S. Generally, it appears that any market information which might exist has been gathered by potential or existing commercial dairy goat operations, and is thus not available for general use.

Three recent government studies have been made of the dairy goat industry in other provinces. The first of these was completed for Agriculture Canada in 1982 by Agriconsultants Inc.[2] Published in French, it provides an analysis of the market for goat milk products in Quebec, Ontario, Alberta, and British Columbia. A similar study in 1985 by Agriculture Canada provided an overview of the entire goat industry in Quebec, including sales of meat and mohair.[8] A third study done in 1984 evaluated the market for goat milk cheese in British Columbia.[10]

The study undertaken by Agriconsultants Inc. included an econometric model which provided an estimate of the consumption of goat

milk dairy products for each province. These estimates were based on an extrapolation of survey results obtained from consumers in Ontario and Quebec. The results of this model are presented in Table 16. The Agriconsultants Inc. estimates are based on consumption of all goat milk products, some of which may be imported. However, for the sake of comparison, per capita consumption in terms of grams milk equivalent per person has been converted in the table to litres of milk per 1,000 population per week.

The results show that Saskatchewan may not be significantly underdeveloped in its goat market in comparison with the rest of the country. With 4.0% of the population, it represents 4.7 of the national consumption, according to the econometric model. Furthermore, the consumption is estimated to be 2.48 litres of milk per thousand population per week. This represents a market about 2.5 times larger than the baseline market of 1.0 litres per thousand population per week discussed earlier.

For the 45 producers surveyed, average weekly sales at the time of the survey (late August - early September) were 582.4 l for pasteurized milk, and 472.8 l for raw milk, for a total of 1,055.2 l per week. If this figure is used as the average production for the year (which is not an unreasonable assumption, since production will be higher in the spring and summer, and lower during the late fall and early winter), then the annual farm-gate sales by these producers is presently 54,870.4 litres. This of course, is very close to an average of one litre per week per 1,000 population for the entire province. This, in turn, suggests that the industry in Saskatchewan is not significantly underdeveloped, according to at least this commonly used criterion. The actual consumption of goat's milk could be considerably higher, given that only 45 producers (albeit the major ones) were surveyed out of potentially more than 1,000. Furthermore, no estimate is included herein of consumption of other goat milk products, either imported or sold at the farm gate. The estimated figure of 129,055 kg M.E. of goat dairy product consumption in Saskatchewan, therefore, which was provided by the Agriconsultants Inc. econometric model, may be reasonably accurate.

Table 16. Estimated Consumption by Province of Goats Milk Dairy Products - 1981

Province	Estimated Total[1] Consumption (kgs of Milk Equivalent)	Population[2] in 1981 (Thousands)	Per Capita Consumption (gm M.E./person)	Consumption (l/1000 Population per week)	% of Total	
					Population	Consumption
Newfoundland	92,534.85	568	163	3.04	2.3	3.4
P.E.I.	18,884.91	123	154	2.88	0.5	0.7
Nova Scotia	132,176.19	847	156	2.91	3.5	4.8
New Brunswick	84,093.19	696	121	2.26	2.9	3.0
Quebec	371,798.61	6,438	58	1.08	26.5	13.5
Ontario	1,163,463.61	8,625	135	2.52	35.4	42.3
Manitoba	134,641.47	1,026	131	2.45	4.2	4.9
Saskatchewan	129,055.09	968	133	2.48	4.0	4.7
Alberta	264,517.32	2,238	118	2.20	9.2	9.6
B.C.	361,064.28	2,744	132	2.46	11.3	13.1
CANADA TOTAL	2,752,229.20	24,343	113	2.11	100.0	100.0

[1]Source: Agriconsultants, 1982.

[2]Source: Canada Year Book, 1985. Statistics Canada Publication No. 11-402, Table 2.1.

3.3.2 Number of Goats Per Capita

Another indication of market development is to compare the number of goats per capita for each province. This information is presented in Table 17. Again, it is apparent that Saskatchewan is not significantly underdeveloped compared to the rest of the country, with 4.82% of the goat population in the 1981 census and 3.98% of the human population. Only Ontario, with its more highly developed goat industry, has a significantly higher number of goats per capita.

The per capita consumption of goats' milk, and the number of goats per capita (i.e. the summarized results of Tables 16 and 17), are combined in Table 18 for ease of comparison.

3.3.3 Comparison of Goat's Milk and Cow's Milk Consumption

According to Agriconsultants, the level of consumption of goat's milk dairy products represents only a small fraction of the consumption of fluid cow's milk in 1981. Total milk sold for fluid purposes in Canada in 1981 was 26,165,000 hectolitres, or 2,694,200,000 kilograms. Since it was estimated by Agriconsultants that 2,752,229 kg of goat milk equivalent was consumed in Canada in 1981 (see Table 16), this represents only 0.10% of the consumption of fluid cow's milk in 1981.[2]

As mentioned previously, annual farm-gate sales by the 45 producers surveyed was estimated to be 54,870 litres. Total fluid milk sales in 1985 in Saskatchewan amounted to 100,089,741 kg, or 103,204,622 litres. Therefore, farm-gate sales by these producers represents 0.05% of cow's milk sales.

Table 17. Number of Goats per Capita, by Province - 1981

Province	Number[1] of Goats	Population (1981)[2] (Thousands)	% of Total		No. of goats per 1,000 population
			Goats	Population	
Newfoundland	296	568	0.33	2.33	0.52
P.E.I.	348	123	0.38	0.51	2.83
Nova Scotia	1,405	847	1.57	3.48	1.66
New Brunswick	816	696	0.91	2.86	1.17
Quebec	13,111	6,438	14.66	26.45	2.04
Ontario	45,500	8,625	50.90	35.43	5.28
Manitoba	4,684	1,026	5.24	4.21	4.57
Saskatchewan	4,317	968	4.82	3.98	4.46
Alberta	10,567	2,238	11.82	9.19	4.72
B.C.	8,795	2,744	9.83	11.27	3.21
CANADA TOTAL	89,389	24,343			3.67

[1]Source: Statistics Canada, Census of Agriculture

[2]Source: Canada Year Book, 1985. Statistics Canada Publication No. 11-402, Table 2.1

Table 18. A Comparison of the Dairy Goat Industry Among the Provinces - 1981

Province	Per Capita Consumption[1] Goats Milk (gms M.E.)	Consumption of Milk[1] (litres per 1,000 population per week)	Number of Goats per Thousand Population[2]
Newfoundland	163	3.04	0.52
P.E.I.	154	2.88	2.83
Nova Scotia	156	2.91	1.66
New Brunswick	121	2.26	1.17
Quebec	58	1.08	2.04
Ontario	135	2.52	5.28
Manitoba	131	2.45	4.57
Saskatchewan	133	2.48	4.46
Alberta	118	2.20	4.72
B.C.	132	2.46	3.21
CANADA TOTAL	113	2.11	3.67

1. Source: Derived from Agriconsultants, 1982.

2. Source: Statistics Canada, Census of Agriculture.

3.3.4 Comparison with U.S. Industry

It is also of interest to compare the level of industry development with that in the U.S. According to statistics provided by the U.S. Department of Commerce, Census of Agriculture, several states seem to be particularly important in terms of the number of milk goats and the sales of goat milk. The results for these states, and for the U.S. as a whole, are presented in Table 19.

It is apparent that Saskatchewan, and Canada as a whole, are not significantly underdeveloped in comparison with the U.S. goat milk industry as a whole. In terms of goat milk sales, however, it would appear that the markets in a number of states, particularly Oregon, are very well developed compared to Canada. Saskatchewan's estimated sales of milk per thousand urban population per week are approximately half those reported for all of Oregon, for example. This gives at least a crude indication of the potential for development of the industry in Saskatchewan.

3.4 Potential Market Size

Farm-gate sales of fluid goat's milk by producers located near major urban centres in Saskatchewan ranged from 0.9 to 12.6 litres per thousand population per week. The average for all the centres served by these producers was 2.35 litres per thousand population per week (see Table 15). The estimated goat milk consumption in Saskatchewan in 1981, according to the econometric model developed by Agriconsultants,[2] was an equivalent of 2.48 litres per thousand population per week (see Table 21).

From all available evidence, therefore, it is assumed that a conservative estimate of the retail market for goat milk in Saskatchewan is 2.5 litres per thousand population per week. This figure will be used as the least optimistic scenario in analyzing the feasibility of various processing options. The most optimistic projections will be based on the

Table 19. A Comparison of the Dairy Goat Industry Among Selected States - 1982

State	Population[1]	Number[2] of Milk Goats	Number of Milk Goats per 1,000 population	Sales[2] of Goat Milk (litres per 1,000 population per week)	Sales[2] ($1,000)
California	23,666,947	17,970	0.75	2.09	1,468
Oregon	2,633,156	6,812	2.6	5.13	374
Washington	4,132,353	5,709	1.4	3.63	598
Wisconsin	4,705,642	7,009	1.5	3.84	444
U.S. TOTAL	237,200,000	166,018	0.70	0.88	6,280

[1]U.S. Department of Commerce, Bureau of the Census, 1980.

[2]U.S. Department of Commerce, Census of Agriculture, 1982.

statistics for Oregon, where sales of approximately 5 litres per thousand population per week were reported for 1982 (see Table 19). The most likely scenario will be assumed to consist of sales of 3.5 litres per thousand population per week.

3.5 Market Characteristics

3.5.1 Fluid Milk

It has been determined that the major use of evaporated goat milk is for feeding infants who have a specific allergic reaction to the major proteins found in cow's milk. The same appears to be true of fluid goat's milk. The producers who were surveyed in this study indicated that almost all of their farm-gate sales were to families with children or infants experiencing allergic reactions to cow's milk.

Cow's milk allergy is distinct from lactose intolerance. The latter is due to impairment of lactose absorption because of an enzyme (ß-D-galactosidase) deficiency. Cow's milk is higher in lactose levels, although the difference is minor. Allergies, on the other hand, are caused by a reaction to cow's milk proteins. Cow's milk contains at least 20 recognized allergens, the main ones being casein, ß-lactoglobulin, and α-lactalbumin, all of which are proteins specific to cow's milk. Common allergic symptoms include gastrointestinal, skin, or respiratory disturbances.

Cow's milk is reported to be the most common food allergen. An ideal approach to estimate the potential market for goat's milk would be to determine the percentage of the population which is allergic to cow's milk. Unfortunately, it is difficult to determine the frequency of cow's milk allergy. Food allergies in general are more prevalent in infants, and diminish with increasing age. Estimates of cow's milk allergy occurrence range from 0.1% of infants to 8.0%, and beyond three years of

age sensitivity to cow's milk is infrequently encountered.[3] Because of problems in obtaining a correct diagnosis, the prevalence of true cow's milk allergy cannot be estimated with any certainty.

For most food allergies, avoiding the offending foods is the most effective treatment. Goat milk has traditionally been viewed as an alternative to cow's milk for infants allergic to the latter. Here again, however, the issue is not clear. To begin with, goat's milk may not always be suitable as a substitute for cow's milk due to the cross-reaction between cow's and goat's milk protein. Unfortunately, the incidence of infants who are allergic to both goat's milk and cow's milk is unknown, although it is claimed that 99% of persons allergic to cow's milk can tolerate goat's milk. Another complication is that a potential hazard of using goat's milk as an infant feed has been identified: unlike cow's milk, goat's milk is apparently deficient in folic acid, and goat's milk may have to be supplemented with other foods high in folic acid. This is a concern emphasized by local nutritionists, and appears to be shared generally by health practitioners.

Goat milk is also reputed to be more easily digested than cow's milk, primarily because the fat globules in goat's milk are smaller. It is thus claimed to be helpful for elderly people and other individuals who have trouble digesting cow's milk. Goat's milk is also reputed to have a greater buffering capacity, being alkaline in reaction. It is, therefore, claimed to be helpful for people suffering from stomach ulcers, or any other illnesses requiring antacid medication.[4] Unfortunately, little research evidence exists to verify such claims.

3.5.2 Cheese

Goat milk cheese has significant advantages over fluid products due to the longer shelf life and a growing acceptance among gourmet food enthusiasts. A study of the market for goat cheese in B.C. in 1984

indicated sales of approximately 11,300 kg per year, imported from France, Norway, Holland, and eastern Canada. Agriculture Canada in 1982 estimated the potential market for goat cheese in B.C. to be 525,000 kg, or 0.5% of the cows milk cheese market. A substantial opportunity for B.C. goat breeders was inferred from these estimates. Interviews with retailers and importers indicated that the most promising varieties are a soft French-style cheese, and firm ripened or unripened varieties.

The existing market for goat's milk cheeses in B.C. was estimated as a percentage of national imports based on population. Although Agriculture Canada compiles information on all cheese imports, they are not permitted to publish information if doing so would reveal sensitive information about a business to its competitors. Therefore, there are some lapses of information on the national imports chart. This is particularly true of Gjetost, which is a Norwegian whey cheese made from goat milk and some cow milk; no statistics regarding imports of Gjetost have been available since 1980. Table 20 contains a summary of Canadian imports of goat's milk cheese from 1976 to 1984. It is important to note that the goat cheese category includes all goat cheeses classified as such; there may be other imported variety cheeses made from goat milk sources that are not reported as such and so may not be accounted for in this category.

Sales of Gjetost in B.C. in 1983 were estimated to be 9,090 kg, and sales of goat cheese were estimated to be between 2,270 and 2,720 kg. Total sales of imported goat cheeses, therefore, were estimated to be approximately 11,300 kg.

Table 20. Canadian Imports of Goat Milk Cheese (tonnes).

	1976	1978	1979	1980	1981	1982	1873	1984	1985
Gjetost	3.2	3.6	22.7	27.2	27.2	*	*	*	*
Goat Cheese	16.8	16.3	12.2	*	*	*	*	21.0	20.0
TOTAL	20.0	19.9	34.9			54.0			

*Business secrecy requirements prevent publication of Import data.
Source: Statistics Canada, Dairy Market Review.

Using similar methods, it is estimated that the 1983 Saskatchewan market for all goat's milk cheeses was approximately 3,990 kg. If the potential size of the market is 0.5% of cow's milk cheese consumption, then the potential market for goat cheese in Saskatchewan can be estimated at approximately 185,000 kg.

Goat cheese is customarily aimed at three segments of the market: health food, gourmet, and ethnic. The gourmet sector is the largest and most important. Disposable income levels tend to be higher, and there is a growing sophistication in eating habits. Popular varieties include the soft French-style Chevre and firm (ripened or unripened) varieties. Pricing can be high relative to other sectors: most retailers indicate that, being a gourmet item, goat cheese is relatively price insensitive within reasonable limits. In 1984, cow's milk cheeses ranged from $6.50/kg for cheddar to $20/kg for some varieties in B.C.. Goat cheeses at that time ranged from $10.50/kg to more than $40/kg. Those from Ontario and Quebec were priced from $18/kg for firm cheese to $25.00/kg for the soft types. Gjetost ranged between $10.70 and $14.20/kg.

Although a market may exist, the B.C. study reported that retailers and importers stressed that the product must be of very high quality and competitively priced. However, cheesemaking is an art, and the proper marketing of cheese requires much expertise. The failure of the Renoir family cheese plant in Alberta and the cheese operation in Jedburgh, Saskatchewan several years serve to indicate the size of the challenge. Some of the factors that have contributed to failures have included poor quality products, uncompetitive price, high production costs, inefficient use of facilities, inconsistent supplies of milk, poor choice of variety, and lack of professionalism in manufacturing, marketing, distribution, and promotion.

It has been suggested that cheese production will be necessary to develop a commercial dairy goat industry in Saskatchewan, in order to compensate for the seasonality of milk production. However, since the most popular style of cheese is likely to be a soft French style cheese, which has a shelf life of only a few weeks, the ability of cheese production to handle variations in supply will be limited. Also, seasonal stability of supply has been identified as an important factor in cheese manufacturing. Furthermore, the volume of milk required may far exceed production in Saskatchewan. Two estimates of break-even cheese production volumes to justify a plant were 2,500 kg and 3,900 kg per month, with two manufacturing days per week. This translates into 800 to 1,200 litres of milk per day; present production of all of the Saskatchewan producers interviewed totals approximately 580 litres per day. For any individual producer or group of producers to expand to the volume required would be a very lengthy and costly undertaking.

3.5.3 Yogourt

Yogourt does not offer an advantage of offsetting the seasonal variations in milk supply experienced in the dairy goat industry. Yogourt made from goat milk, however, does provide very good sales potential; wherever it has been offered in the U.S. it has apparently been well received.

There are, however, a number of factors which may limit the practicality of this option, the first being price. Milk may be purchased primarily for use as a substitute for cow's milk because of allergy problems; the premium to be paid for goat's milk is thus not seen as a significant deterrent. Goat's milk yogourt, however, would most likely be competing directly against cow's milk yogourt, and a cost significantly above that for cow's milk yogourt would not be supported in the market.

Secondly, there are practical difficulties in manufacturing goat's milk yogourt. To begin with, the manufacture of yogourt which is intended to be spoonable and of custard like consistency is somewhat complicated. Some modifications must be made to provide increased viscosity. Three alternatives can be used to do so. The first, adding MSNF (milk solids, non-fat) to the milk, is not likely to be feasible since no commercial supply of MSNF from goat's milk is available. The second involves incubating the milk in the package; all the viscosity developed during incubation is retained, since the product is never agitated after processing. This alternative, however, may require special packaging equipment, and certainly involves more space for incubation. The third alternative is to incorporate a water binding agent or stabilizer (usually a gelatin or special starch) to the milk prior to pasteurization. Any desired viscosity can be attained by adjusting the amount added: less than 1% is usually adequate. This procedure is the simplest and offers good quality control at relatively low cost, but necessitates showing the presence of the additive on the label. Some customers find this objectionable even though some nutritive qualities may be improved by the added material.[9]

Also, it must be remembered that considerable extra capital cost is involved in processing yogourt. While the pasteurizing equipment will certainly be adequate, incubators and special packaging equipment, not to mention additional floor space, will be necessary. This may add an additional $10,000 or more to the cost of a dairy processing plant.

Finally, most yogourt is sold in relatively small (e.g. 175 ml) plastic cup containers, and is usually flavoured. Finding a suitable source of flavourings or fruit for yogourt may be difficult; this was a problem experienced by a pilot operation in the U.S. several years ago.

Determining the existing or potential market for goat's milk yogourt is extremely difficult. Only one of the health food stores surveyed carried yogourt, and this was imported from Washington state. The product was unflavoured, and sold in relatively large containers. Agriconsultants have estimated the potential market to be 3% of the market for cow's milk yogourt. Using 1984 yogourt production, this would amount to a total Canadian market of 1,780,000 kg of yogourt. Based on the proportion of the population, Saskatchewan would represent approximately 4% of the market, or 70,700 kg.

3.5.4 Certified Raw Milk

As far as is known, there are no provinces in Canada which allow the retail distribution of raw milk as is done in several U.S. states. Theoretically, it would be possible for Saskatchewan, or any other province, to revise the regulations to allow for such sales. Obviously, the cost to equip a dairy to market retail raw milk is significantly less than the cost of equipment for pasteurization. A certain degree of quality control would be maintained through the licensing process.

While this may appear to be an attractive option, and one which many producers appear to be in favour of, it must be viewed with caution. To begin with, it is unlikely that the same level of sales would be achieved as with pasteurized milk. The dangers of drinking unpasteurized milk, however remote, have been receiving considerable attention lately in the electronic and print media. Public concern is likely to remain high. Official recognition of the potential hazards of raw milk is also prevalent. A nutritionist with the City of Saskatoon, for example, expressed concern over the fact that raw milk sales are permitted at the farm gate.

This concern may lead to reduced distribution opportunities. The merchandising manager for a major supermarket chain in Saskatchewan, for example, indicated that the chain would not likely be interested in retailing raw milk. This type of concern lies behind Section 44(1) of The Public Health Act (see also Appendix 3):

44(1) Subject to subsections (2) and (3), no person shall sell, offer for sale or deliver:

(a) in a city;
(b) in a town having a population of 1,000 or more as shown by the latest federal census; or
(c) in any other urban municipality that may be designated by the Lieutenant Governor in Council;

milk that has not been pasteurized in a pasteurization plant approved by the minister.

Because of the regulatory and practical constraints facing the concept of retail sales of raw milk, this product is not seen as a feasible option for the Saskatchewan dairy goat industry.

4. REGULATORY FRAMEWORK

As a general rule both in the U.S. and in Canada, goat milk producers and processors are subject to basically the same regulations as the producers and processors of cow's milk. Generally, the regulations involve licensing, standards, and operating procedures for: (1) milk producers, (2) dairy manufacturing plants, and (3) milk transportation. An outline of the producer and processor regulations is presented in Table 21.

Generally, in Canada, the regulations concerning the dairy industry are contained in acts administered by the dairy branches of provincial agriculture departments. In most cases, however, public health acts are also concerned with the dairy industry. Occasionally, the situation can become rather confusing. In Alberta, for example, the regulations under the Public Health Act are actually administered primarily by the Department of Agriculture, Dairy Processing Branch. In Prince Edward Island, the Department of Agriculture has no regulations dealing with the sale of non-pasteurized milk. Under the P.E.I. Health Act, however, the sale of non-pasteurized milk is prohibited. Both Alberta and P.E.I. are in the process of reviewing or rewriting their dairy industry legislation.

In some provinces, including Saskatchewan, farm-gate sales of raw milk are permitted. In these cases however, producers are not permitted to advertise or deliver their milk. In other provinces, raw milk sales are prohibited, such as in P.E.I. No retail sales of certified raw milk are permitted in any of the provinces. Ontario is unique in having developed guidelines for on-farm processing, which apply to both goat's milk and cow's milk. These guidelines provide a useful interpretation of the legislation as it applies to on-farm processing, an approach which may be useful for Saskatchewan.

Table 21. Types of Regulations Pertaining to Producing & Processing Milk.

A. Producers

1) Building Design and General Construction
   - milking parlor
   - stable
   - milk house

2) Equipment
   - milking equipment
   - cleaning and sanitizing equipment

3) Procedures
   - milking
   - storing milk
   - cleaning and sanitizing

4) Licensing
   - procedures for obtaining permits

B. Processors

1) Plant Design and General Construction
   - exterior and location
   - interior
   - rooms

2) Equipment
   - construction/materials/welding
   - location

3) Product Processing
   - raw product receiving and storage
   - product processing
   - finished product storage
   - air, water, and steam supplies

4) Cleaning & Sanitizing
   - equipment cleaning & sanitizing
   - personnel sanitation

5) Waste Disposal

6) Personnel Qualificatons and Licensing Procedures

In Saskatchewan the dairy industry falls under the direct legislative responsibility of two provincial departments and three federal agencies. The regulations pertaining to the dairy industry are contained in three provincial Acts and three federal Acts. These agencies and the corresponding legislation are listed below:

Saskatchewan Agriculture
- Animal Products Act
  - * Dairy Manufacturing Plant Regulations
  - - Dairy Product Grading Regulations
  - - Milk Transportation Regulations
  - * Dairy Producers Regulations

Saskatchewan Health
- Public Health Act
  - * Regulations Governing Milk & Certain Milk Products
  - - Sanitation Regulations

Agriculture Canada
- Canadian Agricultural Products Standards Act
  - - Dairy Products Regulations
- Consumer Packaging and Labelling Act
- Food and Drug Act

Consumer and Corporate Affairs - Canada
- Food and Drug Act
- Consumer Packaging and Labelling act

Health and Welfare Canada
- Food and Drug Act

Milk Control Board
- The Milk Control Act

A dairy manufacturing plant is required to be licensed under the Animal Products Act, the Public Health Act, and the Milk Control Act, in addition to being registered by Agriculture Canada. Certain regulations under the Animal Products Act and the Public Health Act (as indicated with an asterisk in the list above) are reproduced in Appendix 3. These regulations are of the most immediate importance to any individuals considering establishing a processing plant, since they provide the most detail regarding standards of construction, operation, maintenance and sanitation.

Potential processors should also become familiar with other regulations pertaining to the industry. In particular, producers should be aware of the fact that dairy processing plants are inspected at various intervals by Agriculture Canada and Saskatchewan Health. Of greatest importance to a potential goat milk processor is the fact that Saskatchewan Health does unannounced inspections in fluid milk plants approximately four times a year. They also test all milk products for quality on a weekly basis. If the processing plant were to also produce manufactured dairy products, such as cheese or yogourt, Agriculture Canada would take samples of these products twelve or more times a year. Agriculture Canada also coordinates an annual plant inspection and rating.

Any goat milk producer contemplating operating a processing plant must be aware that both the production operation and the processing plant must be licensed. A licensed processing plant can only receive milk from a licensed producer. For some of the potential producer/processors in Saskatchewan, or producers contemplating supplying a processing plant, upgrading of the stable and milking facilities may have to be completed before a producer license can be obtained.

Several documents regarding the dairy goat industry have stressed the importance for producers and potential processors to approach the licensing authorities before beginning any alterations or construction of facilities. Such advice is thoroughly justified. To invest in facilities without the prior approval of those charged with licensing may result in unnecessary expenses to potential operators.

5. PROCESSING FEASIBILITY

5.1 Processing Options

Given the estimated market size for goat's milk in Saskatchewan centres, and the volume presently being produced, developing the industry to the point of commercial scale processing and marketing faces a number of difficult obstacles. Several of these have been discussed elsewhere in the report. This section deals with one of the most challenging problems: establishing a system for processing and packaging of goat's milk.

There are three basic processing alternatives at this time which can be evaluated. The first of these is custom processing, whereby goat milk producers would ship milk to an existing dairy manufacturing plant for processing and packaging. The second alternative is to establish a processing plant specifically for the processing of goat's milk, one which meets all regulations as applied to the dairy manufacturing industry. The third alternative is to make significant regulatory concessions to the dairy goat industry and allow processing with very small scale equipment and facilities designed primarily for home use.

The following sections will describe and evaluate each of these three options in greater detail.

5.1.1 Custom Processing

As discussed previously in the first chapter of the report, most of the commercial goat dairies in other provinces consist of one or more producers shipping milk to a commercial dairy manufacturing plant. Such plants are primarily involved in the processing of cow's milk, and in most cases are probably processing goat's milk in a single run each week. In some cases the weekly volumes are quite small. An example is found in Prince Edward Island, where one producer is having approximately

500 litres processed per week. In some cases, however, the volumes are considerably higher. In Ontario, goat producers supplied 2,345 kilolitres of goats milk to 11 plants licensed to manufacture goat's milk products. This amounts to an average of 4100 litres of goat's milk per plant each week.

This processing option offers several advantages. Perhaps most importantly, the need for a significant capital investment in processing facilities and equipment is avoided. Secondly, producers are not required to develop expertise in establishing and operating processing facilities. Instead, they can devote their time to the important tasks of managing their herds for efficient and stable milk production, and marketing and distributing processed milk.

There is one major disadvantage to this option, one which appears to preclude its application in Saskatchewan: the need for relatively large volumes of goat's milk. The General Manager of Dairy Producers Co-operative Ltd. (DPCL) indicated in an interview that DPCL plants would require a minimum volume of 1800 litres per week, assuming processing occurs once a week. Two major producers in the Regina area, for example, are presently capable of producing approximately two-thirds of this volume, although seasonal variations are still a problem. However, this volume represents about an 80% increase over the presently reported weekly farm gate sales for all of those producers surveyed who are located relatively close to urban centres. It is apparent, therefore, that one such processing operation would be sufficient to satisfy the retail market for virtually the entire province, at least for the foreseeable future. This brings up two corresponding problems: (1) producers who are not located in close proximity to the plant where custom processing is done will be excluded from retail markets due to the high cost of shipping raw milk long distances, and (2) the task of distributing milk throughout the province will be a major one, probably beyond the capabilities of the producers but not of sufficient interest to wholesalers.

5.1.2 Commercial Processing Facilities

Given the fact that custom processing of goat's milk does not appear to be feasible in Saskatchewan under present conditions, developing the industry to the point of commercial scale processing and marketing will require the establishment of at least one plant specifically for processing goat's milk. This option presents one of the most challenging problems facing the industry: establishing a processing plant which meets all regulations at a capital cost which is feasible given the size of the market.

One of the reasons that this is so challenging is that the processing regulations prescribe very high standards. As the producer survey indicated, a number of producers offered the opinion that regulations were too strict, and suggested that regulatory reform should be undertaken to provide regulations specifically for the goat dairy industry. This concern does not appear to be unique to the Saskatchewan goat industry. Macatee reported that in B.C., "Regulatory requirements for buildings, equipment, sanitation, and milk handling were criticized by a number of producers and were identified as a major constraint to the development of a goat product industry." He also pointed out, however, that retailers in B.C. and processors in eastern Canada took the opposite viewpoint: regulatory requirements should be considered as minimum standards needed to assure products of minimum acceptable quality.

This last point should be particularly emphasized. Goat milk producers themselves are the first to admit that the goat industry faces a considerable challenge in attempting to overcome the negative image that goats and goats products have in the public eye. Putting products of unacceptable quality on the shelves of retail outlets will certainly not work to overcome this image problem. Therefore, any possible regulatory reform should be contemplated in the light of its ultimate effects on the potential market for goat milk products, with a view to long term development of the industry.

Nevertheless, it is necessary to recognize that to comply with existing regulations does require facilities, equipment, and procedures of a very high standard of quality. The result is an extremely high capital cost required to construct, equip and operate a processing plant. This problem is compounded by the fact that most dairy processing equipment is designed for the processing of cow's milk in very large volume runs compared to the volume of goat's milk likely to be processed at any plant. Finding equipment of the small scale appropriate for goat milk processing in Saskatchewan is a particularly challenging task.

Near the beginning of the study, the consultants initiated a search for suitable equipment. This search extended to inquiries directed to foreign embassies, and to European, American and Canadian companies. It was believed that European manufacturers would be able to supply processing equipment of an appropriate scale, given that farm processing is practiced in Europe. Such was found to be the case. In fact, one Swiss company (Actimonde S.A.) provides a small, completely self-contained processing plant which is capable of processing 500 litres/hour. The entire operation is enclosed in a container type modular building, complete with generator, and can be towed to different locations. Such equipment is designed for developing countries, where the European Economic Community is devoting efforts to develop markets for its surplus powdered milk production. Unfortunately, such a unit (known as a Pacdairy) costs approximately $450,000 Cdn. Generally it was found that European equipment, while of very high quality and appropriate scale, is very expensive.

Unfortunately, the situation appeared to be no more promising with regard to North American suppliers. Not only was it difficult to find equipment of the appropriate size, but when such equipment was available the costs were again very high.

5.1.2.1 Mini-Dairy Concept

Given this situation, it is apparent that an innovative approach is necessary to develop commercially viable processing facilities. The search for a solution to this problem led the consultants to develop the concept of a "mini-dairy" which uses small but effective equipment.

The mini-dairy concept is designed to meet regulatory and production requirements. It represents a very basic facility capable of batch pasteurizing 30 U.S. gallons (about 115 litres). The number of components in the system has been kept to a minimum, as have the costs for each component. Wherever possible, manual labour is substituted for automated features. It is estimated that such a system could be assembled for approximately $38,000 which includes the cost of a building (estimated to be approximately $11,000). These costs are, with some exceptions, based on the purchase of new equipment. Substituting other used equipment, if available, could lower the capital costs by as much as 25-30%. A breakdown of the equipment and associated costs for this system is presented in Table 22.

According to Macatee, cheese processors in Ontario estimated that the minimum capitalization required for a commercial cheese processing plant in Ontario in 1984 was $200,000, assuming good used equipment and a new building. Quebec has encouraged the development of a "cottage" industry for goat cheese production, so their necessary capitalization is considerably less (i.e. does not exceed $50,000). While the options developed in this report are strictly for milk pasteurization and packaging, the low capital costs may be regarded as placing this option in the realm of cottage industry. Nevertheless, it is important to remember that these options are designed to meet provincial processing regulations.

Appendix 4 provides a detailed description of the equipment and operational steps involved in the mini-dairy concept. A subsequent section of the report will assess the feasibility of this option.

Table 22. Equipment Necessary for Establishing a Conceptualized Mini-Dairy.

	Estimated Cost
Building	$ 11,000
Refrigerators (2)	1,000
Processing kettle - 30 gal U.S. (115 l) electric heat	6,100
Lightning Mixer	300
Recording Thermometer	1,500
Indicating Thermometer	200
Quick chiller	1,200
Stock pot (for surge tank function - 115 l)	500
Form - fill - seal packaging equipment	10,000
Water heater	400
Wash facilities	500
CIP Cleaning ball	1,200
CIP Sanitation Pumps (2)	2,000
CIP Stainless steel circulating line	1,000
Stainless steel pails (8)	400
Stainless steel funnel and screen	50
Dairy thermometer	50
Miscellaneous	600
TOTAL	$ 38,000

5.1.3 Home-Scale Processing

A recent development has emerged in the goat dairy industry in Alberta. One producer in that province has been licensed to produce milk, and also to process milk using a home pasteurizing unit. At present, this producer is milking three does, and sells approximately 45 litres of milk per week, primarily at the farm gate. She does, however, distribute directly to one local restaurant, and is planning to approach other retail outlets.

The most commonly used home pasteurizer is the two gallon (9 litre) Saf-Guard Pres-Vac. This unit sells for a retail price of approximately $175 Cdn, and can pasteurize a batch of milk in approximately 30 minutes. This type of pasteurizer uses pressurized heating in a water bath, and agitation of the milk.

The individual in Alberta has been licensed through a food processor's permit issued by the Drumheller Health Unit under the Public Health Act. The regulatory framework in Alberta is somewhat different than that in Saskatchewan, in that both the Dairy Processing Branch of Alberta Agriculture, and local health units, are involved in the licensing process for dairy manufacturing plants.

There does appear to be some confusion regarding this particular operation in Alberta. The producer claims to be licensed to sell pasteurized milk on a retail basis. The Drumheller Health Unit indicated that small scale processing operations are exempt from the regulations administered by Dairy Processing Branch. The Administrative Director of the Dairy Processing Branch, on the other hand, indicated that a processor cannot sell milk anywhere but at the farm gate, unless that processor is licensed by the Dairy Processing Branch and meets all of the criteria established in the regulations. These regulations are similar to those in Saskatchewan and other provinces.

It appears, therefore, that this processor may not, in fact, be licensed to sell milk through retail outlets or other institutions, but may be restricted to farm-gate sales. At any rate, the issue in Alberta is not clearly resolved, it would appear, and thus does not provide a clear example for the Saskatchewan industry to assess and possibly emulate.

To allow such operations in Saskatchewan to process and sell goat's milk on a retail basis would involve substantial departures from the

present Dairy Manufacturing Plant regulations. Since home pasteurizers are not fitted with recording thermometers, and thus provide no record of proof of pasteurization, the Alberta producer is required to send monthly milk samples for testing. This alone would be a significant departure from existing regulations, and as such may be regarded as a limitation to the practicality of this option.

Another limitation is imposed by the need for effective packaging. The Alberta producer is presently packaging milk in gable-topped milkshake cartons held closed by a plastic clip. It is suggested elsewhere in this report, however, that to maximize the quality, safety, self-life and consumer acceptance of goat's milk, Pure-Pak cartons should be used. Such packaging requires a considerable investment in equipment, however, which would be inconsistent with a home-scale pasteurizing process, since relatively large volumes would be required.

In summary, it appears that the use of home pasteurizers does not appear to be feasible for processing milk to be sold on a retail basis.

5.2 Evaluation of Processing Options

Of the three processing alternatives presented in the previous section, mini-dairy processing facilities established specifically for processing goat's milk appears to be the most practical. Custom processing by an existing dairy manufacturing plant is virtually precluded because of the large volumes of milk required. Home-scale processing does not satisfy the Dairy Manufacturing Plant Regulations, nor would it be of sufficient scale to justify the type of packaging necessary for retail marketing.

The following section assesses the feasibility of the mini-dairy concept. This assessment involves a break-even analysis, market potential, and pro forma income statements.

5.3 Mini-Dairy Concept Feasibility

In order to determine the potential feasibility of the mini-dairy, it is necessary to make a number of critical assumptions regarding such factors as the potential market size, fixed and variable costs, and milk prices. The following sections of the report will clearly describe and provide the rationale for these assumptions.

It must be emphasized that this report represents a preliminary feasibility assessment for the industry as a whole. An individual intending to establish and operate a processing plant will need to undertake a more detailed feasibility study for that particular plant. Many particular details regarding the plant will be required to supplant the assumptions used in this study. It may be possible, for example, for an individual to establish a processing plant for significantly less than the cost assumed in this report by employing used equipment to a greater extent. Conversely, it may be found that certain equipment suggested in this option will have to be replaced by more complex and expensive equipment.

Therefore, potential processors must be aware of the fact that this feasibility assessment is very general, and is necessarily based on several critical assumptions. The results of this study should not be construed as being directly applicable to the operations of any one particular processor or location. Furthermore, the viability of a processing operation will ultimately depend on the quality of its management. The consultants assume no liability for the performance of any actual processing facilities which may be established and operated based on this concept.

5.3.1 Market Potential

Reported sales of milk at the farm gate amount to an average of 2.35 litres weekly per thousand population (see Table 15). Based on this figure, and the assumption that retail sales, within a certain price range, will exceed farm-gate sales it is assumed that 2.5 litres weekly per thousand population is a conservative estimate of retail fluid milk sales. The most likely scenario assumes sales of 3.5 litres weekly per thousand population, a figure which is attained in several of the U.S. states with a more mature goat industry. A sales volume of 5.0 litres weekly per thousand is assumed to be reasonable for a "best-case" scenario. This is approximately equal to the sales achieved in Oregon, and is approached or exceeded by the level of farm gate sales in three Saskatchewan centres. Therefore, this figure should be assumed to be optimistic, but not unrealistic or unattainable.

In evaluating the feasibility of processing facilities, it is assumed that the processor will be located in close proximity to one of the province's two major centres. To determine the market population for each of these centres, the Economic Development Officers of each city were contacted. Unfortunately, each of the cities defines its primary and secondary trading areas somewhat differently, as indicated below.

Trading Area	Population	
	Saskatoon	Regina
City	179,000	173,700
Primary Trading Area	240,000	185,505
Secondary Trading Area	550,000	---
Secondary 1	---	210,797
Secondary 2	---	317,492

For the sake of comparison, it was assumed that the applicable trading area for either Saskatoon or Regina consists of a population of 225,000. This results in the following sales scenarios:

	Conservative Scenario	Target Volume	Optimistic Scenario
Weekly Sales/Thousand	2.5 litres	3.5 litres	5.0 litres
Population	225,000	225,000	225,000
Total Weekly Sales	562.5 litres	787.5 litres	1,125 litres
Total Annual Sales	29,250 litres	40,950 litres	58,500 litres

Sales of fluid cow's milk in 1985 for Regina and Saskatoon were 31,623,050 litres and 30,789,404 litres, respectively. As a percentage of fluid sales of cow's milk, therefore, these scenarios are represented as follows:

	Conservative Scenario	Target Volume	Optimistic Scenario
% of Regina cow's milk sales (1985)	0.09%	0.13%	0.18%
% of Saskatoon cow's milk sales (1985)	0.09%	0.13%	0.19%

These assumptions are consistent with the Agriconsultant's conclusions that the goat milk consumption levels represented 0.095% of the market for fluid cow's milk in Canada in 1981.[2]

5.3.2 Milk Prices

The producer survey indicated that pasteurized milk sells at the farm gate for an average price of $1.26/litre, with a range of $1.00 to $1.80. Personal interviews with producers and processors have revealed that the retail price for pasteurized goat milk in other provinces ranges from $1.89/l to $1.92, although Agriconsultants in 1982 found that goat's milk was selling in B.C. retail outlets for a price as high as $1.98/l.[2] For the purposes of this study, a retail price of $1.92/l will be assumed.

Industry sources indicate that a retail margin of 20-25% of the retail selling price is a common range for dairy products. Since goat's milk would be perceived by most retailers as a specialty item, a higher margin would be considered justifiable. Therefore, a margin of 25% of the selling price will be assumed. This represents a margin of $0.48/litre, yielding a wholesale price of $1.44 to be received by the processor.

The results of the producer survey indicated that the average price of raw milk sold at the farm gate is $1.18/l, and ranges from $0.88/l to $1.54/l. Producers supplying a processor, however, cannot expect to receive such prices for their raw milk, since the processor, of course, must cover costs and realize a reasonable return on investment. Interviews with processors in Alberta indicated that producers supplying milk to one processor received $0.80/l for milk used in the production of pasteurized fluid milk or yogourt. However, producers only received $0.35/l for milk utilized in cheese production. Presumably, such milk would be produced during the peak production season, and would be in excess of that required for fluid milk sales. Another processor in Alberta which produces only cheese pays $0.60/l for milk from producers.

Some goat dairy manufacturers pay on a tier system. One fluid milk processor in Ontario in 1984 was paying $0.65/l on a base volume and $0.55 for volumes above this level as an incentive for winter milk production. The base is the lowest monthly volume shipment during the year.

Saskatchewan producers surveyed were asked what they considered to be the minimum price of milk to make the operation of a commercial goat dairy feasible. The responses ranged from $0.65/litre to $1.10/litre, with an average of $0.82/litre. For the purposes of this study, a producer price of $0.80/litre will be assumed. This, in turn, results in a margin to the processor of ($1.44 - $0.80 = $0.64/litre (see Table 23). In the 1984 study of the market for goat milk cheese in B.C., goat milk prices in the range of 60-80 cents were justified on the basis that goat husbandry is substantially more labour intensive than that required for cows. Cow milk dairymen in B.C. at the time of that study were receiving approximately 37 cents per litre.[10]

5.3.3 Processing Costs

Processing costs can be divided into two categories: variable costs and fixed costs. Variable costs include labour, packaging, distribution, utilities, and miscellaneous supplies, and can be estimated on a per unit basis. Appendix 5 contains a detailed description of these processing costs, with the exception of labour. Assigning a per unit labour cost would be difficult and very arbitrary, since the owner of the plant would also be providing the labour. Also, the time to process and package each unit of milk would be highly dependent on the actual specifications of the plant. In examining this assessment, therefore, it must be remembered that the labour element of variable costs must come out of the final income figure. Excluding labour, the unit variable costs are estimated to be $1.01/litre, as shown in Table 23.

Table 23. Estimated Milk Prices and Variable Costs for a Conceptual Mini-Dairy Plant.

	Milk Prices per Litre
Retail Price[1]	$ 1.92
Retail Mark-Up (@ 25% of retail)[2]	0.48
Wholesale Price	1.44
Cost of Raw Milk[1]	0.80
Processing Margin (cents per litre) (% of wholesale)	$ 0.64

	Variable Costs per Litre
Cartons[3]	$ 0.06
Distribution[4]	0.04
Utilities[1]	0.05
Miscellaneous Supplies[1]	0.02
Milk Loss/Returns[5]	0.04
Subtotal	0.21
Add: Cost of Raw Milk	0.80
Total Estimated Variable Costs	$ 1.01

1. Estimated by consultants. Some costs are arbitrary when no information is available on the precise cost.
2. Normal industry mark-up for specialty food product.
3. Price provided by carton supplier.
4. Distribution cost based on consultant estimates.
5. Based on 3 per cent of sales.

See: Appendix 5.

Table 24. Estimated Fixed Costs for a Conceptual Mini-Dairy Plant.

Overhead		
Depreciation (10 year straight line method)		$ 3,800.00
Processor License		35.00
Property Taxes[1]		500.00
Property Insurance[1]		456.00
Utility Service[1]		350.00
Liability Insurance[2]		700.00
Total Overhead		$ 5,841.00
Loan Repayment		
Principal	$38,000.00	
Interest Rate	12%	
Term (years)	10	
Payments		$ 6,725.40
Total Estimated Fixed Costs		$12,566.40

1. Estimated by consultants and subject to variation depending on specific location, etc.

2. May vary considerably depending on rates in effect at time of operation.

See: Appendix 5.

Fixed costs include overhead (i.e. depreciation, processing license, property taxes and insurance, liability insurance, and utility base charges), as well as interest. Again, these costs are described in detail in Appendix 4. Note that the loan repayment assumes 100% debt financing. In reality, considerable equity financing will be provided by the processor/owner. For the equity portion, therefore, a potential processor may wish to substitute a higher discount rate to compensate for risk. Total fixed costs, as shown in Table 24, are assumed to be $12,566.40.

5.3.4 Break-Even Analysis

Given the assumed variable and fixed costs, it is now possible to determine break-even volume. The break-even analysis is presented in Table 25. Based on the assumptions used in this analysis, the break-even point for the processing plant (without providing a wage for the operator) is a unit volume of 29,224 litres, or a dollar sales volume of $42,082.82 per year. This break-even analysis can now be compared with the potential market, as in the following section.

5.3.5 Pro Forma Income Statements

Table 26 presents pro forma income statements based on the assumed milk prices, fixed and variable costs, and sales volumes for a plant located near Saskatoon or Regina. Under the conservative scenario, the plant breaks even, but provides no return to the operator(s) for the labour input. If a slightly higher discount rate were used in place of the interest rate, to provide an adequate adjusted return on investment to the processor, then the plant would experience a net loss at this volume (even though a positive cash flow would probably result, particularly since depreciation does not represent a cash outflow for the year).

Table 25. Break-Even Analysis for a Conceptual Mini-Dairy Plant.

Total Fixed Costs	$12,566.40
Unit Selling Price	$1.44/litre
Unit Variable Costs	$1.01/litre
Contribution	$0.43/litre
Contribution Margin	29.86%

Unit Break-Even Volume

$$= \frac{\text{fixed costs}}{\text{unit selling price} - \text{unit variable costs}}$$

$$= \frac{\$12,566.50}{\$1.44 - \$1.01} = 29,224 \text{ litres}$$

Dollar Break-Even Volume

$$\frac{\text{fixed costs}}{\text{contribution margin}}$$

$$= \frac{\$12,566.90}{29.86\%} = \$42,082.82$$

Table 26. Pro Forma Income Statements for a Conceptual Mini-Dairy Plant.

	Conservative Scenario	Target Volume	Optimistic Scenario
	29250 l/yr	40950 l/yr	58500 l/yr
Sales	$42,120.00	$58,968.00	$84,240.00
Cost of Raw Milk	23,400.00	32,760.00	46,800.00
Gross Margin	$18,720.00	$26,208.00	$37,440.00
%	44.44%	44.44%	44.44%
Variable Costs:			
Packaging Material	$ 1,755.00	$ 2,457.00	$ 3,510.00
Distribution Cost	1,170.00	1,638.00	2,340.00
Utilities	1,462.50	2,047.50	2,925.00
Misc. Supplies	585.00	819.00	1,170.00
Milk Loss and Returns	1,170.00	1,638.00	2,340.00
Total Variable Costs	$ 6,142.50	$ 8,599.50	$12,285.00
Overhead:			
Depreciation	$ 3,800.00	$ 3,800.00	$ 3,800.00
Processor License	35.00	35.00	35.00
Property Taxes	500.00	500.00	500.00
Property Insurance	456.00	456.00	456.00
Utility Service	350.00	350.00	350.00
Liability Insurance	700.00	700.00	700.00
Total Overhead	$ 5,841.00	$ 5,841.00	$ 5,841.00
Total Operating Costs	$11,983.50	$14,400.50	$18,126.00
Operating Income (Loss)	$ 6,736.50	$11,767.50	$19,314.00
Loan Repayment	$ 6,725.40	$ 6,725.40	$ 6,725.40
Income (Loss) Before Return for Management and Labour	$ 11.10	$ 5,042.10	$12,588.60

Under the target volume scenario, a more substantial compensation for labour input would be provided. However, assuming that processing occurred every second day, which would require processing two batches given the size of the equipment involved, then each processing day would provide an income of about $27.63. Whether this is sufficient to compensate a processor depends on the time involved in processing, and the desired "wage." The optimistic scenario, on the other hand, would provide $68.98 per processing day, but would require processing more than 2 batches of milk each processing day.

5.3.6 Feasibility Assessment for a Conceptual Mini-Dairy

Commercial goat dairying can be a risky farming and processing investment. There are many goat dairies which are struggling financially, and the turnover rate in the industry is high. Potential processors and suppliers of milk to processors must be aware of this situation. The challenges facing a potential commercial goat milk processor are significant.

The principle obstacles to the growth of processing on an industrial level are weak demand, the high cost of raw milk, high production costs, cost of transport, and irregularity of supply. All these lead to a high end price to the consumer, which does not encourage extensive consumer purchase. These factors limit development and the extension of the range of products to give a better product mix. The net effect of all these circumstances favour local cottage industries serving the surrounding district. Because a mini-dairy would only require a part-time operator, and is highly dependent on a consistent milk supply, an integrated producer/processor operation appears to be a logical alternative.

For producers to make the transition from farm-gate sales to commercial processing and marketing of goat's milk is an extremely large step. First, producers will need to become efficient at managing their herds for maximum and seasonally stable production of high quality milk. Second, producers will need to develop the entrepreneurial abilities to

locate the equipment and capital necessary to establish a processing plant. Third, processors will have to develop the technical abilities to produce and package milk of consistently high quality while maintaining sanitary conditions. Finally, processors will have to develop expertise in the area of marketing, to ensure that milk is efficiently distributed to a ready market.

There is a general agreement among commercial goat breeders that a successful milk producer must be dedicated, experienced, professional in approach, efficient, well financed, and quality minded. The same could be said about potential processors.

It is apparent that there is potential for a commercial dairy goat industry in Saskatchewan. It is equally apparent, however, that to develop processing facilities will require a great deal of effort by producer/processors on several fronts. Success is by no means guaranteed: potential processors must recognize both the considerable effort required and the riskiness of financial returns. Under the least optimistic scenario, for example, a processing plant would just approach the break-even point, based on all costs except for labour. Of course it is necessary to consider the returns on the milk production itself. Setting a price for milk of 80¢ per litre may provide a sufficiently high return on production to compensate for the low return on processing. A potential producer/processor, therefore, will have to carefully weigh the economics of <u>all</u> aspects of the operation (including sales of meat and breeding stock).

Based on production levels closely matching milk sales, and average yearly production of milk per doe of 688 kg, the number of milking does required can be estimated. Under the conservative, target volume, and optimistic scenarios contained in Table 26, the milking herd would have to include 45, 60, or 85 does, respectively. Given that the processor/producer will be devoting considerable time to processing and marketing, it appears that it will be necessary to draw part of the milk supply from at least one other milk producer.

6. CONCLUSIONS

1) The number of dairy goats in Saskatchewan has grown in recent years largely due to the demand for goat's milk by persons allergic to the protein complement in cow's milk.

2) The industry, however, is a cottage-scale industry which sells milk from the farm-gate. It currently produces approximately 0.1% of the output of the cattle dairy industry.

3) Compared to most other provinces, Saskatchewan is under-developed in the dairy goat industry. The major constraint to expansion of the dairy goat industry is a lack of licensed processors which can sell milk to retail markets. If licensed processors were established, the industry could probably expand to between 0.2% and 0.5% of cow's milk sales.

4) Goat milk processing facilities will be smaller in Saskatchewan than in other provinces due to the province's small population centres. We estimate that current market conditions warrant 100 litre batch processing plants. The study identifies several commercially available milk processing systems; however, no supplier could provide equipment to economically process 100 litre batches.

5) We believe that a 115 l per batch mini-dairy could be established using restaurant-style equipment combined with the necessary recording and indicating thermometers. The cost of this mini-dairy is estimated to be less than $40,000 for equipment and building, provided innovation and entrepreneurial skills are used.

6) Given the sales and cost assumptions used in the analysis, a 115 litre batch processing plant could produce up to 1,000 litres per week and provide part-time income for the owner/operator with good management skills. The feasibility of specific operations depends on the operator, proximity to market, and costs, which must be assessed by each entrepreneur before entering the business. Given our interviews with major retailers, and the regulations, certified raw milk is not acceptable because of the liability risk, confusion with pasteurized milk, and public concern, which is reflected in provincial and municipal restrictions on the sale of raw milk.

7) To become commercially successful however, a goat milk processor must overcome several obstacles such as:

(1) locating and adapting small scale equipment
(2) meeting regulations
(3) market requirements for Pure-Pak cartons
(4) processing and sanitation requirements
(5) marketing and distribution requirements.

8) If current farm-gate marketers of goat's milk decide to establish facilities for milk sales to retailers, the processors should realize that they must sell only to retailers to win their business. This will require foregoing farm-gate sales for retail sales.

7. RECOMMENDATIONS

1) We recommend that the current regulations established for milk remain in effect for goat's milk. However, to aid the development of goat milk processing, Saskatchewan Agriculture and Saskatchewan Health should establish guidelines which interpret the regulations as they apply to small scale goat milk production and processing.

2) Goat milk processsing will require part-time employment for an owner/manager and a reliable supply of raw milk. Therefore, we recommend that the industry develop with integrated production and processing on farms to provide full-time employment and consistent supply.

3) Producers will have difficulty making the transition from farm-gate sales to processing and marketing for retail markets. Owner/managers by themselves may not be able to develop skills in all areas, such as locating equipment, process operation, sanitation and marketing.

   To overcome the lack of commercial equipment and supplier services for a 100 litre batch system, we recommend that a prototype mini-dairy be designed and constructed by faculty and students at the University of Saskatchewan as a class project. This system would be developed based on a commitment from a processor.

4) To provide assistance in the areas of process operation, sanitation, business administration and marketing, we recommend a faculty/student project to prepare an instruction manual on the processing and marketing of goat's milk. Financing of this project could occur through the student business consulting service offered by the University of Saskatchewan.

5) The producer survey indicated a strong need by producers for more government assistance in market development and extension services. We also recognize that the Department's budget is limited and it is beyond the scope of this study to determine the goat industry's priority in this budget. Therefore, we recommend that the Department of Agriculture review its current level of assistance and, where possible, expand its assistance in relationship to the size of the goat industry.

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APPENDIX 1

HARVEST FOODS LIMITED

GOAT MILK PRODUCER SURVEY

APPENDIX 1. GOAT MILK PRODUCER SURVEY.

I. Market Potential

1. Approximately when did you first become involved in keeping dairy goats?

2. What is the present size of your dairy goat herd?

Milking does _____
Bucks _____
Kids _____

3. Do you sell goat milk at the farm gate? _____

If so, what are you average weekly sales:
In the summer? _____
In the winter? _____

What is the price you charge for raw milk? _____

What is the price you charge for pasteurized milk? _____

4. Do you produce other dairy product? _____

Do you sell any of these products? _____

If so, how much do you sell and for what price?

5. Have you received inquiries about the possibility of purchasing raw or pasteurized goat milk or other dairy goat products at retail outlets? Please specify.

6. Are you selling goats for meat?

At the farm gate? _____

At auctions? _____

Do you sell breeding stock? _____

II. Production Potential

7. What is your current raw milk production per week:

In summer? _____

In winter? _____

Does demand for your milk ever exceed supply? _____

8. Do you wish to expand the size of your herd? _____

What would be the price range for raw milk within which you would consider expanding? _____

At the minimum price level, what size of milking herd would you expand to? _____

9. What would you consider the minimum viable herd size for a commercial dairy goat producer? _____

10. Are you aware of other goat milk producers in your area?

Name _____ Location _____

Phone Number _____

III. Potential for Processing Facilities

11. Do you personally believe that there is sufficient potential market demand for goat milk to make a centralized processing plant feasible in Saskatchewan?

12. Would you be interested in supplying raw milk to a goat milk processing plant?

13. Are you interested in setting up a plant on your farm?

14. What suggestions do you have for possible government assistance (financial aid, legislative change, etc.)?

Other Comments:

APPENDIX 2

SURVEY OF HEALTH FOOD STORES

APPENDIX 2. SURVEY OF HEALTH FOOD STORES.

1. Do you presently sell any of the following goat milk products? If so, what is the price and estimated quantity sold? What is the source of each product?

Evaporated Goat Milk — Quantity Sold _____

Source _____ — Price _____

Powdered Goat Milk — Quantity Sold _____

Source _____ — Price _____

Goat Milk Cheese — Quantity Sold _____

Source _____ — Price _____

Goat Milk Yogourt — Quantity Sold _____

Source _____ — Price _____

Other Goat Milk Products:

2. Would you be interested in selling goat milk and goat milk products produced in Saskatchewan? _____

3. Have you had customer inquiries regarding fluid goat milk or other goat milk products? _____

4. What price do you think fluid goat milk should sell for at the retail level?

5. What potential do you see for the market for fluid goat milk and other products?

6. Based on customer inquiries, do you believe that the market would favour raw goat milk, or pasteurized?

APPENDIX 3

SASKATCHEWAN DAIRY PRODUCERS AND DAIRY MANUFACTURING PLANT REGULATIONS

Province of Saskatchewan

SASKATCHEWAN REGULATION 52/79

THE ANIMAL PRODUCTS ACT, 1978 – SECTIONS 15 AND 18
O.C. 230/79, dated February 13, 1979

Published in The Saskatchewan Gazette, dated Friday, March 2, 1979; Volume 75, No. 9; Part II; Pages 117-121.

(Filed February 15, 1979.)

ORDER:

His Honour, the Lieutenant Governor in Council on the recommendation of the Minister of Agriculture pursuant to Sections 15 and 18 of The Animal Products Act, 1978, hereby makes The Dairy Producers Regulations in accordance with the schedule attached hereto effective upon proclamation of Clause (b) of Section 19 of The Animal Products Act, 1978.

SCHEDULE

THE ANIMAL PRODUCTS ACT, 1978

Regulations governing the licensing of persons as dairy producers, defining quality standards for milk; prescribing price differentials respecting quality standards; prescribing the standards for construction, equipment, maintenance and operation of dairy facilities; and prohibiting the use of certain chemical substances which may impair the quality of milk under provisions of Sections 15 and 18 of The Animal Products Act, 1978.

Title

1. These regulations may be cited as "The Dairy Producers Regulations".

Interpretation

2. In these regulations:

(a) "Act" means The Animal Products Act, 1978;

(b) "administrator" means the person who manages or directs dairy programs for the Animal Industry Branch of the department;

(c) "3-A sanitary standards" means the standards of fabrication and design for dairy equipment formulated by the International Association of Milk, Food and Environmental Sanitarians, the United States Public Health Service and The Dairy Industry Committee, as amended from time to time;

(d) "bulk tank cooler" means a stationary farm storage tank maintained in a milk house and used for cooling and storing milk on the premises of a dairy producer and includes fixtures and equipment for the use thereof;

(e) "class 'A' licence" means a licence issued to a dairy producer who, in the opinion of the minister or any person authorized by the minister, produces milk which meets the standards for fluid milk quality together with all the requirements respecting dairy facilities, equipment and health and sanitation as set out in these regulations;

(f) "class 'B' licence" means a licence issued to a dairy producer who, in the opinion of the minister or any person authorized by the minister, produces milk which does not meet the standards for fluid milk quality or some of the requirements respecting dairy facilities, equipment and health and sanitation as set out in these regulations.

(g) "cream" means that portion of milk, rich in milk fat, which rises to the surface of milk upon standing or which is separated from it by centrifugal force and shall contain not less than 18 percent milk fat;

(h) "dairy barn" means a building used to house dairy cattle and milking goats and includes stanchion or tie barns, free-stall barns, loose housing barns or any other type of structure serving a like purpose;

(i) "dairy farm" means any place or premises where one or more lactating females of the bovine or caprine species are kept and from which a part or all of the milk is sold, offered for sale or delivered, for human consumption, and includes all buildings, yards and premises occupied or used in connection with the production of milk;

(j) "dairy manufacturing plant" means a place where any dairy product is pasteurized, standardized, dehydrated or otherwise processed and shall include a cheese factory, a creamery, a cream receiving station and an ice cream plant;

(k) "dairy producer" means a person who supplies milk to a dairy manufacturing plant;

(l) "department" means the Department of Agriculture for the Province of Saskatchewan;

(m) "director" means the Director of the Animal Industry Branch of the department;

(n) "fluid milk" means milk used for the fluid trade;

(o) "industrial milk" means milk used in the manufacture of dairy products but does not include milk used for the fluid trade;

(p) "inhibitor" means any antibiotic, medicine or chemical preparation which can be detected in milk;

(q) "inspector" means any person appointed as or authorized to be an inspector under the Act;

(r) "licensee" means a dairy producer licensed under these regulations;

(s) "milk" means the natural lacteal secretion obtained from one or more lactating females of the bovine or caprine species and includes cream, skim milk and any other portion of milk;

(t) "milk house" means a separate building or space in a building which contains a milk room which is associated with the production of milk on a diary producer's premises and which includes any of the following additional components if present:

(i) a vestibule;

(ii) a washroom; and

(iii) an equipment room.

(u) "milking parlour" means a room where lactating females of the bovine or caprine species may be milked;

(v) "milk room" means the area or room in a milk house for:

(i) cooling and storing milk in a bulk tank cooler;

(ii) storing milking equipment, utensils and cleaning supplies; or

(iii) washing and sanitizing milking equipment, utensils and the bulk tank cooler;

(w) "milk transport operator" means the driver-operator of a milk transportation unit;

(x) "milk transportation unit" means a truck or trailer tank used for transporting milk from dairy farms to dairy manufacturing plants or from one dairy manufacturing plant to another;

(y) "official sample" means a homogeneous sample of at least 100 ml of milk transferred aseptically to a sterile sample container by any person authorized or approved by the administrator from any milk supply, and maintained at a temperature between 1 and 4°C for testing in accordance with standard methods;

(z) "representative sample" means a homogeneous sample of at least 100 ml of milk transferred aseptically to a sterile sample container by a milk transport operator from a dairy producer's milk supply after the milk has been agitated for a period of not less than five minutes and maintained at a temperature between 1 and 4°C, for submission to a laboratory approved by the administrator for testing in accordance with standard methods;

(aa) "standard methods" means the most recently published "Standard Methods for the Examination of Dairy Products", as amended from time to time, and approved for publication by the American Public Health Association;

(bb) metric units used herein shall be construed with reference to The International System of Units (SI); and

(cc) words not herein defined shall be construed with reference to the interpretations of the Act, The Dairy Manufacturing Plant Regulations, The Milk Transportaton Regulations and The Dairy Product Grading Regulations, such regulations made under the Act.

Licensing

3. (1) No person shall supply milk to a dairy manufacturing plant in Saskatchewan unless he is the holder of a valid and subsisting licence as a dairy producer issued under these regulations.

(2) Licences shall be in the form issued by the department and signed by the minister, or any person authorized by the minister.

(3) No licence shall be transferrable.

(4) Every licence shall, unless previously cancelled or suspended, expire on the date indicated on the licence.

Licences Under The Dairy Products Act

4. Licences issued under regulations made under The Dairy Products Act and filed as Saskatchewan Regulation 219/70 shall continue and be subject to these regulations and be deemed to have been issued under and meet the requirements of these regulations and such licences shall continue in force until December 31, 1978, unless sooner suspended or cancelled pursuant to these regulations.

Licensing Exemptions

5. Notwithstanding subsection (1) of section 3, a person who delivers cream only, and not any other portion of milk, to a dairy manufacturing plant is not required to be licensed under these regulations.

Conditions Respecting Licensing of Dairy Producers

6. (1) Every person required to be licensed under these regulations as a dairy producer shall make application to the director for a licence in the form issued by the department.

(2) The minister, or any person authorized by the minister, may issue a class 'A' licence to any dairy producer who, in his opinion, meets all the provisions for a class 'A' licence.

(3) Notwithstanding subsection (2), any dairy producer who, in 1978, was licensed as a fluid milk producer and whose facilities did not meet the basic standards referred to in subsection (1) of section 10 shall have until January 2, 1982, to comply with the standards established by these regulations.

(4) The minister, or any person authorized by the minister, may issue a class 'B' licence to any dairy producer who, in his opinion, does not meet all the provisions for a class 'A' licence.

(5) The minister, or any person authorized by the minister, may refuse any application for a new licence or the renewal of an existing licence where a dairy producer has failed to comply with any of the provisions of the Act or these regulations regulating such a person.

(6) Every licensee shall, at all times, comply with these regulations.

Licensing Fees

7. No fees shall be charged for licences issued under these regulations.

Licences to be Displayed

8. Every licensee shall ensure that his licence is displayed at all times in a conspicuous place in his milk house.

Suspension or Cancellation of Licences

9. Where a licensee has failed to comply with any of the provisions of the Act or of these regulations, the minister, or person authorized by the minister, may:

(a) suspend the licence and, in such case, such notice of suspension in writing shall be given to the licensee and the licensee shall surrender forthwith his licence to the director;

(b) reinstate a suspended licence if the licensee, within 30 days of the notice of his suspension, furnishes evidence to the satisfaction of the director that he can comply with provisions of these regulations on account of which the licence was suspended and the director shall give to the licensee notice in writing that his licence has been removed from suspense, together with the reinstatement of the licence; or

(c) where the licence has not been removed from suspense within the 30 days referred to in clause (b), cancel the licence and the director shall give notice of the cancellation to the licensee by registered mail.

Dairy Facilities and Equipment Requirements

10. (1) A dairy producer designing, constructing or renovating a dairy barn or milk house shall first obtain the written approval of the administrator and such design, construction or renovation shall meet the standards prescribed in Part 1 Basic Standards for dairy facilities in the most recent edition of The Canadian Farm Building Code as issued by the Associate Committee on the National Building Code, National Research Council of Canada.

(2) A dairy producer installing any milking equipment shall, prior to its installation, obtain the written approval of the administrator and such equipment shall be installed according to standards approved by The Committee on National Standards for Milking as set forth in "Equipment Standards".

(3) A dairy producer shall ensure that the milking equipment he uses meets all the 3-A sanitary standards.

(4) Unless otherwise approved by the administrator, a dairy producer shall have not more than one bulk tank cooler and such bulk tank cooler shall have a capacity sufficient to hold and cool milk from six consecutive milkings at peak production.

(5) A dairy producer shall ensure at all times that:

(a) the bulk tank cooler meets all the 3-A sanitary standards; and

(b) the bulk tank cooler is provided with lugs on which to place a spirit levelling device.

(6) A dairy producer shall co-operate with the administrator or any person authorized by the administrator in:

(a) ensuring that the measuring rod or device and conversion chart are accurate; and

(b) ensuring that the bulk tank is level.

Dairy Facilities Restricted

11. No person shall:

(a) unless approved by the administrator, permit animals other than those of the bovine or caprine species to be stabled in a dairy barn;

(b) permit animals other than females of the bovine or caprine species to enter a milking parlour;

(c) permit animals of any species to enter a milk house or milk room.

Criteria Relating to Health and Sanitation Requirements

12. A dairy producer shall ensure at all times that:

(a) his dairy farm is clean and sanitary and meets with the approval of the administrator or any person authorized by the administrator;

(b) his dairy barn is:

(i) managed in such a way as to keep the fly and insect population at a minimum level; and

(ii) kept clean with the walls and ceiling painted or white-washed at regular intervals;

(c) his milking parlour is kept clean, the walls and ceiling are painted at regular intervals and the floor is flushed with water after each milking;

(d) his milk house and milk room are kept painted, clean and tidy;

(e) the water supply he uses for all dairy purposes is of adequate quantity and potable quality;

(f) the equipment used for production and handling of milk is cleaned after each use, sanitized before each milking, stored in a sanitary manner and kept in good condition;

(g) milking is done under clean and sanitary conditions and that no milking is done other than in a stanchion barn or milking parlour;

(h) freshly drawn milk is cooled immediately and maintained at between 1° to 4°C in accordance with 3-A sanitary standards; and

(i) persons who do the milking or who enter the milk house meet the following conditions:

(i) be cleanly in their habits;

(ii) keep their hands clean while engaged in work;

(iii) wear clean washable outer garments;

(iv) refrain from any unsanitary practise that may result in contamination of milk or equipment;

(v) be free of any communicable disease.

Prohibited Milk

13. No person shall sell, supply or offer for sale any milk:

(a) that contains antibiotics, insecticides, herbicides, coloring matter, preservatives, added water or anything foreign to milk including disagreeable odours and taste;

(b) that is produced within five days after parturition; and

(c) from an animal known to be infected by a disease injurious to human health, including tuberculosis and brucellosis, unless such milk is first pasteurized in a dairy manufacturing plant.

14. A dairy producer shall co-operate with and permit an inspector, or any person authorized by the administrator, to collect samples of milk for testing and such samples may be either representative or official samples.

Fluid Milk Quality Standards

15. A dairy producer supplying fluid milk to a dairy manufacturing plant shall ensure that all such fluid milk:

(a) tests negative for inhibitory substances; and

(b) on three out of five consecutive tests, does not exceed:

(i) a standard plate count of 75,000 colonies of bacteria per ml;

(ii) a somatic cell count of 1,000,000 cells per ml; and

(iii) a freezing point value of -0.530°C.

16. (1) A dairy producer who has supplied to a dairy manufacturing plant any fluid milk which is prohibited under section 13 or which does not meet the standards prescribed in section 15, such shall constitute an infraction and the dairy producer shall be subject to a price differential, as prescribed in subsection (2), for the full month in which the infraction occurred for all the fluid milk supplied in that month.

(2) Subject to subsection (1), the price differential for:

(a) the first infraction shall be $0.55 per 100 kg below the blend price established by the Milk Control Board; and

(b) for the second infraction within a 12 month period following which the first infraction occurred, shall be $1.10 per 100 kg below the blend price established by the Milk Control Board.

(3) A dairy producer who has supplied to a dairy manufacturing plant fluid milk which is prohibited under section 13 or which does not meet the standards prescribed in section 15, in addition to being subject to a price differential for his milk, shall, upon such notice in writing from the administrator, be:

(a) required to ship his milk as industrial milk; or

(b) prohibited from making further milk shipments;

until such time that evidence is furnished to the satisfaction of the administrator that the milk of the dairy producer is no longer prohibited under section 13 or that it meets the standards prescribed in section 15.

(4) Where fluid milk from a dairy producer is prohibited under section 13 or does not meet the standards prescribed in section 15, the tests performed during the month following that in which the infraction occurred shall constitute the commencement of a new consecutive series of tests as prescribed in section 15.

Industrial Milk Quality Standards

17. A dairy producer supplying industrial milk to a dairy manufacturing plant shall ensure that all such industrial milk

(a) tests negative for inhibitory substances; and

(b) on three out of five consecutive tests, does not exceed

(i) a standard plate count of 300,000 colonies of bacteria per ml,

(ii) a somatic cell count of 2,000,000 cells per ml, and

(iii) a freezing point value of -0.530°C.

18. (1) A dairy producer who has supplied to a dairy manufacturing plant any industrial milk which is prohibited under section 13 or which does not meet the standards prescribed in section 17, such shall constitute an infraction and the dairy producer shall be subject to a price differential, as prescribed in subsection (2), for the full month in which the infraction occurred for all the industrial milk supplied in that month.

(2) Subject to subsection (1), the price differential for:

(a) the first infraction shall be $0.55 per 100 kg below the price established by the purchasing agency for industrial milk; and

(b) for the second infraction within a 12 month period following which the first infraction occurred, the price differential shall be $1.10 per kg below the price established by the purchasing agency.

(3) A dairy producer who has supplied to a dairy manufacturing plant industrial milk which does not meet the standards prescribed in section 17, in addition to being subject to a price differential for his milk, shall, upon such notice in writing from the administrator, be prohibited from making further milk shipments until such time that evidence is furnished to the satisfaction of the administrator that the milk of the dairy producer meets the standards prescribed in section 17.

(4) Where industrial milk from a dairy producer does not meet the standards prescribed in section 17, the tests performed the month following that in which the infraction occurred shall constitute the commencement of a new consecutive series of tests as prescribed in section 17.

Compliance with Director's Requirements

19. Where, in the opinion of an inspector, the administrator, the director or his designate, a person who is subject to these regulations is in default of any regulation, such person shall comply with such requirements, and within the time the director may specify, to remedy any such default.

Province of Saskatchewan

SASKATCHEWAN REGULATION 53/79

O.C. 231/79, dated February 13, 1979

Published in The Saskatchewan Gazette, dated Friday, March 2, 1979; Volume 75, No. 9; Part II; Pages 121-130.

(Filed February 15, 1979.)

ORDER:

His Honour, the Lieutenant Governor in Council on the recommendation of the Minister of Agriculture pursuant to Sections 15 and 18 of The Animal Products Act, 1978, hereby makes The Dairy Manufacturing Plant Regulations in accordance with the schedule attached hereto effective upon proclamation of Clause (b) of Section 19 of The Animal Products Act, 1978.

SCHEDULE

THE ANIMAL PRODUCTS ACT, 1978

Regulations governing the licensing of persons operating dairy manufacturing plants; prescribing the standards for construction, equipment, maintenance and operation of dairy manufacturing plants; prescribing the price differentials between cream grades; defining the grade standards, the manner and conditions of grading, inspection, packaging, marketing, advertising, sale and display of dairy products; prescribing the size, kind, branding and labelling for dairy products; regulating the use of chemical substances, the methods for reporting and prescribing the standards for cleanliness and payment respecting dairy products under the provisions of Sections 15 and 18 of The Animal Products Act, 1978.

Title

1. These regulations may be cited as "The Dairy Manufacturing Plant Regulations".

Interpretations

2. In these regulations:

(a) "Act" means The Animal Products Act, 1978;

(b) "administrator" means the person who manages or directs dairy programs for the Animal Industry Branch of the department;

(c) "analyst" means an analyst employed or appointed by the Province of Saskatchewan or the Government of Canada and having authority to make analyses for public purposes;

(d) "3-A sanitary standards" means the standards of fabrication and design for dairy equipment formulated by the International Association of Milk, Food and Environmental Sanitarians, the United States Public Health Service and the Dairy Industry Committee, as amended from time to time;

(e) "bacterial culture" means a growth of harmless, acid and aroma producing bacteria;

(f) "brand" means a mark, stencil, stamp, label or writing placed on any dairy product;

(g) "butter" or "creamery butter" means butter manufactured in a creamery from pasteurized milk fat and containing no substance other than water, milk solids, bacterial culture, common salt and coloring matter;

(h) "Canada Dairy Products Regulations" means the regulations, as amended from time to time, established under The Canada Dairy Products Act, as amended from time to time;

(i) "cheddar cheese" means cheese made from the matted and milled curd of milk by the cheddar process, or from milk by any other procedure which produces a finished cheese having the same physical and chemical properties as the cheese produced by the cheddar process, and may contain a bacterial culture or a colouring matter approved under the Food and Drug Regulations (Canada) and shall contain on a dry matter basis not less than 50 percent milk fat;

(j) "cheese factory" means a place where milk is received and manufactured into cheese;

(k) "composite sample" means a sample comprising two or more representative samples of milk or cream taken over a determined time period, and which accurately represents the total volume with respect to composition thereof;

(l) "cream" means that portion of milk, rich in milk fat, which rises to the surface of milk upon standing, or which is separated from it by centrifugal force, and shall contain not less than 18 percent milk fat;

(m) "creamery" means a place where milk or cream is received and manufactured into butter;

(n) "cream receiving station" means a place where cream is received and purchased for the purpose of being forwarded to a dairy manufacturing plant for processing or manufacturing;

(o) "dairy blend" means a product manufactured as a food spread from pasteurized milk fat and vegetable oil and containing no substance other than water, milk solids, salt, food and preservatives, colouring matter, artificial flavours and vitamin D, and where the vegetable oil content is more than 40 percent, shall also contain vitamin A;

(p) "dairy butter" or "farm butter" means butter made on a farm or a place not licensed as a dairy manufacturing plant;

(q) "dairy manufacturing plant" means a place where any dairy product is pasteurized, standardized, dehydrated or otherwise processed and shall include a cheese factory, a creamery, a cream receiving station and an ice cream plant;

(r) "dairy manufacturing plant operator" means a person in charge of a dairy manufacturing plant and includes the owner thereof;

(s) "dairy producer" means a person who supplies milk to a dairy manufacturing plant;

(t) "dairy product" or "milk product" means milk, cream, butter, cheese, ice cream, condensed milk, evaporated milk, milk powder, dry milk, malted milk, milk shake mix, ice milk, sherbet, yogurt or any other product manufactured wholly or mainly from milk;

(u) "department" means the Department of Agriculture for the Province of Saskatchewan;

(v) "director" means the Director of the Animal Industry Branch of the department;

(w) "Food and Drug Regulations" means the regulations, as amended from time to time, established under The Food and Drug Act (Canada), as amended from time to time;

(x) "homogenized milk" means milk which has been subjected to a mechanical process to prevent visible separation of milk fat in milk;

(y) "ice cream mix" means the combination of cream, milk, or other milk products with or without the addition of flavouring, fruits, nuts or confections, and may also contain stabilizers and emulsifiers approved under The Food and Drug Act, which, when frozen, produces ice cream;

(z) "ice cream plant" means a building, room or portion thereof wherein ice cream is manufactured;

(aa) "imitation dairy product" means any food substance other than a dairy product, of whatever origin, source or composition, which is manufactured for human consumption and for the same use as or in semblance of a dairy product, and which is manufactured wholly or in part from any fat or oil other than that of milk;

(bb) "inspector" means any person appointed as or authorized to be an inspector under the Act;

(cc) "licensee" means a person licensed under these regulations;

(dd) "margarine" means any food substance other than butter, of whatever origin, source or composition, which is manufactured for the same use as or as a substitute for butter;

(ee) "marketing" or "market" includes selling offering for sale, advertising, assembling, sorting, shipping or transporting in any manner;

(ff) "milk" means the natural lacteal secretion obtained from one or more lactating females of the bovine or caprine species and includes cream, skim milk or any other portion of milk;

(gg) "milk fat" or "butterfat" means the fat of milk;

(hh) "milk transport operator" means the driver-operator of a milk transportation unit;

(ii) "official sample" means a homogeneous sample of at least 100 ml of milk transferred aseptically to a sterile container by any person authorized or approved by the administrator from any milk supply and maintained at a temperature between 1° and 4°C for testing in accordance with standard methods;

(jj) "pasteurization" or "pasteurize" means the process for destroying pathogenic bacteria which may be present in milk by heating to temperatures and holding for time periods as follows:

(i) 63°C for 30 minutes, then cooled; or

(ii) 72°C for 16 seconds, then cooled; or

(iii) any other temperature and time as approved by the administrator;

(kk) "reconstituted milk" means milk resulting from the combining of whole milk constituents with water;

(ll) "representative sample" means a homogeneous sample of at least 100 ml of milk transferred aseptically to a sterile sample container by a milk transport operator from a dairy producer's milk supply after the milk has been agitated for a period of not less than five minutes and maintained at a temperature between 1 and 4°C, for submission to a laboratory approved by the administrator for testing in accordance with standard methods;

(mm) "standard methods" means the most recently published "Standard Methods for the Examination of Dairy Products", as amended from time to time, and approved for publication by the American Public Health Association;

(nn) "metric units used herein shall be construed with reference to The International System of Units (SI); and

(oo) words not herein defined shall be construed with reference to the interpretations of the Act, the Milk Transportation Regulations, the Dairy Product Grading Regulations and the Dairy Producers Regulations, such regulations made under the Act.

Licensing

3. (1) No person shall carry on business as a dairy manufacturing plant operator in Saskatchewan unless he is the holder of a valid and subsisting licence issued under these regulations.

(2) Licences shall be in the form issued by the department and signed by the minister or any person authorized by the minister.

(3) Every person who operates more than one stationary, permanent place of business shall obtain a branch licence for each such place of business.

(4) No licence shall be transferrable.

(5) Every licence shall, unless previously cancelled or suspended, expire on the date indicated on the licence.

Licences and Bonds under The Dairy Products Act

4. (1) Licences issued and bonds furnished under regulations made under The Dairy Products Act and filed as Saskatchewan Regulation 219/70 shall continue and be subject to these regulations and be deemed to have been issued and furnished under and meet the requirements of these regulations and such licences shall continue to be in force until December 31, 1978, unless sooner suspended or cancelled pursuant to these regulations.

(2) Notwithstanding anything in these regulations to the contrary, bonds furnished under regulations made under The Dairy Products Act and filed as Saskatchewan Regulation 219/70 and continuing pursuant to subsection (1), shall be subject to the terms, conditions and limitations as prescribed in regulations made under The Dairy Products Act and filed as Saskatchewan Regulation 219/70 notwithstanding the repeal of regulations made under The Dairy Products Act and filed as Saskatchewan Regulation 219/70.

Conditions Respecting Licensing of Dairy Manufacturing Plants

5. (1) Every person required to be licensed under these regulations shall make application to the director for a licence in the form issued by the department.

(2) Upon application, payment of the prescribed fee and fulfillment of other obligations under these regulations, the minister or any person authorized by the minister may issue a dairy manufacturing plant licence to the applicant.

(3) The minister or any person authorized by the minister may refuse any application for a new dairy manufacturing plant licence or the renewal of an existing licence where a licensee has failed to comply with any of the provisions of the Act or these regulations regulating such a person.

(4) Every licensee shall, at all times, comply with these regulations.

Bonding of Dairy Manufacturing Plants

6. (1) Before a dairy manufacturing plant licence is issued to a dairy manufacturing plant operator, the licensee as principal may be required by the director to furnish a bond in favour of Her Majesty the Queen in Right of Saskatchewan with a surety in such form and under and subject to such conditions as are prescribed under these regulations and any amendment or substitution to these regulations, such bond to be approved by the director and to be in the penal amount not in excess of $5000.00 for any dairy manufacturing plant.

(2) The bond furnished under the provisions of subsection (1) shall cover operations during the period prior to the expiration of the dairy manufacturing plant licence and, if a claim is made or paid under the bond, upon such event, the licensee who furnished the bond shall forthwith furnish a new bond satisfactory to the director.

(3) The form and conditions of the bond to be furnished by a dairy manufacturing plant operator shall be in Form A in the schedule to these regulations.

(4) To every bond to be furnished by a dairy manufacturing plant operator under these regulations, except a bond furnished by a corporate dairy manufacturing plant, executed under its corporate seal, there shall be annexed an Affidavit of Witness in Form B in the schedule to these regulations made by the attesting witness to the execution of the bond by the dairy manufacturing plant operator.

Surety and Bond Payment

7. (1) Where the director finds that a dairy manufacturing plant operator has failed to pay a person the full amount due him for milk or cream as specified in sections 11 and 12, he may require the sureties to pay the deficiency and, in default of their doing so, may take proceedings to enforce the bond for the benefit of the person or he may assign the bond to the person, if deemed expedient.

(2) Where a dairy manufacturing plant operator has made an assignment for the general benefit of creditors or has been adjudged a bankrupt, the director may assign the bond to the trustee in bankruptcy or to the receiver for the benefit of unpaid persons specified in subsection (1).

Licensing Fees

8. (1) The fee for a new licence shall be $20.00.

(2) The fee for the renewal of a licence shall be $20.00 where the prescribed fee and the application for a licence renewal made by the applicant, who holds a valid and subsisting licence, is received by the director by November 30 or such later date approved or authorized by the director with respect to any application.

(3) The fee for the renewal of a licence made by an applicant holding a valid and subsisting licence shall be $40.00 with respect to any application received by the director after November 30 and which date has not been extended by the director under subsection (2).

Licences to be Displayed

9. (1) Every licensee shall ensure that his licence is displayed at all times in a conspicuous place in the dairy manufacturing plant.

(2) Every licensee shall ensure that the licences of his graders testers and milk transport operators are displayed at all times in the dairy manufacturing plant.

Suspension or Cancellation of Licences

10. Where a licensee has failed to comply with any of the provisions of the Act or of these regulations regulating the licensee, the minister of any person authorized by the minister, may:

(a) suspend the licence and, in such case, such notice of suspension in writing shall be given to the licensee and the licensee shall surrender forthwith his licence to the director;

(b) reinstate a suspended licence if the licensee, within 30 days of the notice of his suspension, furnishes evidence to the satisfaction of the director that he can comply with the provisions of these regulations on account of which the licence was suspended and the director shall give to the licensee notice in writing that his licence has been removed from suspense, together with the reinstatement of the licence; or

(c) where the licence has not been removed from suspense within the 30 days referred to in clause (b), cancel the licence and the director shall give notice of the cancellation to the licensee by registered mail.

Payment and Statements to a Dairy Producer for Milk

11. (1) Every licensee shall, on or before the 15th day of each month, make final payment of the full amount payable to each dairy producer for milk received during the previous month.

(2) Notwithstanding subsection (1), an interim payment may be made for milk received during the first 15 days of a month.

(3) Every licensee shall provide a statement with each final payment to a dairy producer and each statement shall include:

(a) the milk shipping period which the statement covers;

(b) the quantity, in kg, of milk supplied by him during the period;

(c) the grade of milk if payment is based on grade;

(d) the percent milk fat of the milk shown to the second decimal place; and

(e) the payment rate per 100 kg of milk.

Payment and Statements to Persons for Cream

12. Every licensee shall, at intervals of not more than 14 days, pay each person the full amount due him for cream purchased and shall, with every payment, provide a statement showing:

(a) the cream shipping period which the statement covers;

(b) the quantity, in kg, of cream supplied by him during the period;

(c) the butterfat content, in kg, of such cream;

(d) the grade of such cream;

(e) the percent milk fat of the cream shown to the first decimal place; and

(f) the payment rate per kg of milk fat.

Price Differentials for Cream

13. A dairy manufacturing plant operator shall ensure that the following minimum price differentials shall apply in the purchase of all cream of the different grades specified:

(a) a premium of at least $0.15 per kg of milk fat shall be paid for special grade cream over first grade cream; and

(b) a premium of at least $0.10 per kg of milk fat shall be paid for first grade cream over second grade cream.

Permit to Establish a Plant and Appointment of a Board

14. (1) A person desiring to establish a dairy manufacturing plant shall make application to the minister for a permit to do so.

(2) The minister shall appoint a board consisting of three members to which the minister shall submit all applications received by him for permits to establish a dairy manufacturing plant.

(3) Upon receipt of an application, the board shall inquire as to the necessity for the proposed dairy manufacturing plant having regard to the potential volume of production, the market feasibility and such other factors as may affect the development of the dairy industry in the area proposed to be served, and shall make such recommendation to the minister as it determines.

(4) Upon the recommendation of the board, the minister may grant a permit for the establishment of a plant.

Remuneration for Board

15. The members of the board shall receive such remuneration as the minister may determine.

Granting of a Permit

16. (1) No person shall, for the purpose of operating a dairy manufacturing plant, erect a building or establish a dairy manufacturing plant in an existing building unless the site thereof and the plans and specifications therefor have first been approved by the minister.

(2) A person to whom a permit has been granted under subsection (4) of section 14 shall show progress toward establishment of the dairy manufacturing plant, satisfactory to the minister, within six months from the date of issuance of the permit and, if such person fails to do so, the permit may be cancelled forthwith.

Criteria for Dairy Manufacturing Plants

17. Every licensee shall ensure that his dairy manufacturing plant is designed and continously maintained to meet the following standards and requirements:

(a) the surroundings are well drained and kept free of any source of pollution including decayed garbage, vermin, flies, insects or rodents;

(b) the building exterior is of sound construction and well maintained;

(c) the water supply used in the preparation or processing of food products is of potable quality;

(d) the walls and ceilings of rooms or buildings in which dairy products are processed, manufactured or stored are constructed of a smooth impervious material which is light in colour;

(e) the floors shall be sloped to trapped drains in a manner which prevents pooling or entrapment of liquids;

(f) the level of illumination:

(i) on a task is not less than 300 lux in all areas where food products are prepared, processed, packaged or stored;

(ii) is not less than 1000 lux in inspection areas; and lights shall have a shatterproof protective covering;

(g) ventilation in all processing areas is adequate to keep the walls and ceilings relatively free of condensation and offensive odours;

(h) outside openings are effectively screened or otherwise protected against the entrance of flies, insects, rodents and vermin;

(i) separate lavatories and dressing rooms are provided for males and females unless otherwise approved by the administrator; and

(i) they are separate from rooms in which dairy products are processed or handled;

(ii) the door from a lavatory does not open directly into or be directly accessible from a processing area; and

(iii) they are kept clean and mechanically ventilated to the outside;

(j) dressing rooms are equipped with individual lockers for storing employees' personal effects;

(k) every room in which dairy products are handled, processed, manufactured or stored, including dry storage areas, is well maintained, kept clean and free of dust, debris or any other source of contamination; and

(l) hand washing facilities complete with hot and cold water, detergent, sanitary towels and covered receptacles are located convenient to all working areas where dairy products are manufactured.

Dairy Manufacturing Plant Operational Standards

18. Every licensee shall ensure that his dairy manufacturing plant meets the following operational standards and requirements:

(a) the product contact surface of all equipment used in the handling, processing, manufacturing or storage of dairy products conforms to 3-A sanitary standards or otherwise is approved by the administrator;

(b) milk received from dairy producers is stored at a temperature of between 1 and 4°C until processed;

(c) milk storage tanks are:

(i) designed to hold the product between 1 and 4°C;

(ii) equipped with a thermometer which is accurate within 1°C; and

(iii) cleaned and sanitized at least once every 72 hours and each time the tank is emptied, unless otherwise approved by the administrator;

(d) the ingredients used in the manufacture of dairy products are pasteurized unless otherwise approved by the administrator;

(e) the pasteurization process for dairy products is in accordance with accepted practices and the method employed is subject to the approval of the administrator;

(f) pasteurization equipment is designed, maintained and operated in accordance with 3-A sanitary standards;

(g) pasteurization equipment is provided with:

(i) an indicating thermometer which is accurate within 1°C; and

(ii) unless otherwise approved, a recording thermometer that corresponds to the indicating thermometer at pasteurizing temperatures;

(h) a daily chart for the recording themometer includes the following information:

(i) the date of pasteurization;

(ii) product identification; and

(iii) signature of the operator of the pasteurization equipment;

(i) daily recording themometer charts are kept for a period of 90 days;

(j) (i) all equipment used in the manufacture of dairy products is maintained in a sanitary condition;

(ii) equipment which is not designed for cleaning in place is disassembled and cleaned after each day's use;

(iii) all equipment used in the manufacture of dairy products is effectively sanitized before use;

(iv) corroded or defective equipment is not used; and

(k) dairy products are stored at temperatures and under such conditions as are conducive to maintaining their quality.

Sanitary Standards Respecting Dairy Manufacturing Plant Employees

19. Every licensee shall ensure that those persons directly employed in the handling and preparation of dairy products in his dairy manufacturing plant meet the following conditions:

(a) be cleanly in his habits;

(b) keep his hands clean while engaged in work;

(c) wear clean washable outer garmets that are free of buttons or pockets above the waist;

(d) wear protective hair and beard covering;

(e) refrain from any unsanitary practice that may result in contamination of a food product;

(f) be free of any communicable disease; and

(g) provide upon request an annual medical health certificate.

Reporting and Records to be Maintained

20. (1) Every licensee shall furnish the department with such statistical data respecting milk purchases and other information pertaining to his dairy manufacturing plant in such form and at such times as the administrator may direct.

(2) Subject to subsection (1), every licensee shall make in such form as the administrator may direct a return each month showing:

(a) (i) the number of kg of milk fat purchased from producers as cream;

(ii) the number of kg of cream in each grade; and

(iii) the amount, by grade, paid to producers for the cream purchased;

(b) (i) the number of kg of cream received or purchased from another dairy manufacturing plant; and

(ii) in kg of milk fat, the receipts in each grade;

(c) for the cream received or purchased, its disposition, in kg, for:

(i) buttermaking;

(ii) ice cream production;

(iii) domestic trade; or

(iv) transfer to some other point.

Standards of Composition in the Manufacture or Marketing of Dairy Products

21. A licensee shall ensure that dairy products manufactured or marketed by him meet the following standards of composition:

(a) "butter" shall be made from pasteurized milk fat and shall contain not less than 80.0 percent milk fat.

(b) butter-margarine blend" or "margarine-butter blend" shall be either of the following dairy blend formulations:

(i) 50/50 type shall contain, by weight, not less than 40.0 percent milk fat and not less than 40.0 percent vegetable oil; or

(ii) 80/20 type shall contain, by weight, not less than 64.0 percent vegetable oil and not less than 16.0 percent milk fat.

(c) "buttermilk" shall be milk or re-constituted milk in which lactic acid has been produced by aid of a bacterial culture or other chemical method as approved by the administrator.

(d) "buttermilk powder" or "dried buttermilk" shall be the product obtained after buttermilk has been subjected to a drying process and shall contain not less than 95.0 percent milk solids.

(e) "cottage cheese" shall be made from dairy products and shall contain not more than 80.0 percent water and 0.5 percent stabilizing agent.

(f) "creamed cottage cheese" shall be cottage cheese containing cream or a mixture of cream with milk or skim milk, or both, in such quantity that the final product shall contain not less than 4.0 percent milk fat and not more than 80.0 percent water.

(g) "ice cream" shall be the frozen food made from ice cream mix and shall contain not less than 36.0 percent milk solids and 10.0 percent milk fat, or where cocoa, chocolate syrup, fruits, nuts or confections have been added, not less than 8.0 percent milk fat.

(h) "ice milk" shall be the frozen food made from dairy products and shall contain not less than 33.0 percent solids and not less than 3.0 percent and not more than 5.0 percent milk fat.

(i) "(naming the flavour) milk" shall be a product made from dairy products with the addition of a flavouring preparation and shall contain not less than 3.0 percent milk fat and added vitamin D.

(j) "(naming the flavour) partly skimmed milk" shall be the product made from dairy products with the addition of a flavouring preparation and shall contain not less than 0.3 percent and not more than 3.0 percent milk fat and added vitamins A and D.

(k) "(naming the flavour) skim milk" shall be a product made from dairy products with the addition of a flavouring preparation and shall contain not more than 0.3 percent milk fat and added vitamins A and D.

(l) "partly skimmed milk" shall be milk in which the milk fat content is not less than 2.0 percent and shall contain added vitamins A and D.

(m) "partly skimmed milk with added milk solids" shall contain not less than 10.0 percent milk solids not including fat and have added vitamins A and D.

(n) "pasteurized milk" shall be milk which contains not less than 3.25 percent milk fat and not less than 8.0 percent solids other than milk fat and added vitamin D.

(o) "skim milk" shall be milk which contains not more than 0.3 percent milk fat and added vitamins A and D.

(p) "skim milk with added milk solids" shall contain not less than 10.0 percent milk solids and not more than 0.3 percent milk fat and added vitamins A and D.

(q) "skim milk powder" shall be the product obtained when skim percent milk solids and skimmilk powder, skimmed milk powder, dry skim milk, dry skimmed milk, powder skim milk, powdered skim milk or powdered skimmed milk shall have the same meaning.

(r) "substandard cream" shall be cream standardized to contain not less than 10.0 percent milk fat, and the milk fat content shall appear in plainly legible characters on a label affixed to the container, the bottle cap or on the main panel.

(s) "whey powder" shall be the product obtained when whey is subjected to a drying process and shall contain not less than 95.0 percent milk solids.

(t) "whipping cream" shall be cream containing not less than 32.0 percent milk fat.

(u) "yogurt" shall be the semi-liquid or frozen dairy product which has been fermented by the addition of bacterial cultures and may contain fruit, fruit juices or other flavouring preparations.

Canada Regulations Apply

22. Every person who manufactures or markets any dairy products in Saskatchewan shall at all times comply with the Canada Dairy Products Regulations and The Food and Drug Regulations.

Canada Regulations Apply to Manufacturing or Marketing Within Saskatchewan

23. (1) For the purpose of establishing grades, standards and regulations governing the use of grade names, grading, issuing of grade certificates and the packing and marking of butter, cheddar cheese and dry skimmed milk powder, all the regulations set forth in Part 1, Divisions A, B and C of the Canada Dairy Products Regulations, mutatis mutandis, shall apply to these products when manufactured or marketed within the Province of Saskatchewan and the said regulations, mutatis mutandis, shall be deemed to be regulations made pursuant to the Act and by reference are hereby incorporated and made part of these regulations in respect of the manufacturing or marketing of the said products in Saskatchewan.

(2) The Canada Dairy Products Regulations and The Food and Drug Regulations, mutatis mutandis, insofar as they are not inconsistent with any other regulation in these regulations, shall be deemed to be regulations made pursuant to the Act and by reference are hereby incorporated made pursuant to the Act and by reference are hereby incorporated and made part of these regulations in respect of the manufacturing or marketing of dairy products in Saskatchewan.

Identification of Blends

24. (1) Dairy blend formulation types shall contain the words "butter" and "margarine", and the first named constituent shall indicate the largest numerical proportion, by weight, of milk fat or oil in the formulation.

(2) Notwithstanding subsection (1), where the proportions of butter and margarine are equal, the word "butter" shall always precede the word "margarine".

(3) All packaged dairy blends shall be prominently identified as either a butter-margarine blend or a margarine-butter blend on the main panel and shall state the formulation type in either words or Arabic numerals which shall be at least the same height as the words "butter-margarine" or "margarine-butter".

(4) The ingredients in a dairy blend shall be listed together on any panel, other than the bottom panel, in descending order from the largest to the smallest ingredient proportion, by weight, and the fat of milk shall be described only as milk fat.

Grade Name to be Advertised

25. Every person who advertises cheddar cheese, butter or skim milk powder for sale or who places a placard upon cheddar cheese, butter or skim milk powder for the purpose of promoting sales within the province shall include in the advertisement or placard respecting the cheddar cheese, butter or skim milk powder, the grade name as prescribed by these regulations.

Prohibited Sales of Adulterated or Misbranded Milk and Dairy Products

26. (1) No person shall market adulterated, misbranded or improperly grade or prepared milk or any dairy product which fails to conform to the applicable definition or standard prescribed by these regulations.

(2) Respecting subsection (1):

(a) milk or any dairy product shall be deemed to be adulterated within the meaning of these regulations where it falls below the standards fixed by, or otherwise fails to conform to, the provisions of these regulations;

(b) milk or any dairy product shall be deemed to be misbranded where there is attached to it when marketed for human consumption a label containing any untrue or misleading name, device or statement, or it is not labelled or marked in accordance with the provisions of these regulations;

(c) any dairy product which does not conform to these regulations found on the premises of a manufacturer, wholesaler or retailer, shall be deemed to be for sale:

(i) where such a product is packaged in consumer-sized packages; or

(ii) where such a product is in bulk or in packages other than consumer-sized packages;

and not labelled "Not for Sale".

Sample Fails to Meet Standard

27. Where, upon analysis of samples of milk or dairy products taken from any dairy producer or person who buys or markets milk or any dairy product for human consumption, such samples do not conform to the standards prescribed by these regulations the analyst shall issue a certificate stating his findings and the certificate so given shall be prima facie proof of the facts stated therein and of the authority of the person giving or making the certificate and report without any proof of appointment or signature.

Imitation Dairy Products Prohibited

28. (1) No person shall manufacture or market any imitation dairy product.

(2) Notwithstanding subsection (1), the following imitation dairy products shall be exempted:

(a) butter-margarine or margarine-butter blends; and

(b) any food product intended for use as a dessert topping or coffee whitener.

Milk Transportation

29. No dairy manufacturing plant operator shall transport or cause to be transported milk other than by a licensed milk transport operator.

Milk Purchases

30. No dairy manufacturing plant operator shall purchase milk from a dairy producer unless the producer is the holder of a valid and subsisting dairy producer's licence.

Compliance with Director's Requirements

31. Where, in the opinion of an inspector, the administrator, the director or his designate, a person who is subject to these regulations is in default of any regulation, such person shall comply with such requirements, and within the time the director may specify, to remedy any such default.

SCHEDULE

Form A

DAIRY MANUFACTURING PLANT OPERATOR'S BOND

KNOW ALL MEN BY THESE PRESENTS, THAT I/We _____

_____ (hereinafter called the Principal) as Principal and we, _____

_____ (hereinafter called the Surety) as Surety are held and firmly bound unto Her Majesty the Queen in right of Saskatchewan (hereinafter called the Obligee) in the penal sum of _____ Dollars ($_____) of lawful money of Canada, to be paid unto the Obligee, her successors and assigns, for which payment well and truly to be made, we jointly and severally bind ourselves, our executors, administrators, successors and assigns firmly by these presents.

SEALED with the respective seals of the Principal and of the Surety and dated the _____ day of _____ 19___

NOW THE CONDITION of the above obligation is such that if the said obligation does not by reason of any act, matter or thing at any time hereafter become or be forfeit under The Dairy Manufacturing Plant Regulations, as amended from time to time, under The Animal Products Act, 1978, then the said obligation shall be void but otherwise shall be and remain in full force and effect and shall be subject to forfeiture as provided by the said regulations and Act.

PROVIDED that if the said Surety at any time gives three calendar months' notice in writing to the Principal and to the Director of the Animal Industry Branch of the Department of Agriculture for the province of intention to terminate the obligation hereby undertaken then this obligation shall cease and determine in respect only of any act, matter or thing taking place, arising or done subsequent to the date named in the notice of termination of the obligation hereby undertaken but shall remain in full force and effect in respect of all acts, matters and things taking place, arising or done from the date hereof to the date of such termination. Notice of any claim hereunder shall be made upon the Surety within two years following the date of termination as herein provided.

IN WITNESS WHEREOF the Principal who is an individual, association or partnership has subscribed his name and set his seal and the Principal who is a body corporate and the Surety have caused their respective corporate seals to be affixed attested under the hands of their respective proper officers in that behalf the day and year first above written.

SIGNED, SEALED AND DELIVERED
in the presence of

(If Principal an INDIVIDUAL)

_____ _____ (SEAL)
Witness Principal

(If Principal an ASSOCIATION)

_____
Name of Firm

_____ (SEAL)
_____ (SEAL)
_____ _____ (SEAL)
Witness _____ (SEAL)

(If Principal a PARTNERSHIP)

_____
(Name of Firm)

_____ (SEAL)
_____ _____ (SEAL)
Witness _____ (SEAL)

(If Principal a BODY CORPORATE)

SEALED AND DELIVERED _____
(Name of Body Corporate)
By: _____ (SEAL)
SEALED AND DELIVERED As _____
As _____ (SEAL)
(Name of surety)
By: _____
_____ (SEAL)

Form B

AFFIDAVIT OF WITNESS

CANADA
Province of Saskatchewan
TO WIT:

I, _____ of the _____ of _____ in the Province of _____, _____ (occupation)

Make oath and say:

1. That I was personally present and did see _____ named in the annexed instrument, and who is known to me to be the person named therein, duly sign and execute the same for the purpose named therein; that the same was executed at the _____ of _____ in the Province of _____ on the _____ day of _____, 19____, and that I am the subscribing witness thereto;

2. That I personally know the said _____ and he is in my belief of the full age of eighteen years.

Sworn before me at the
_____ of _____
in the Province of _____
this _____ day of _____
A.D., 19____

_____
A Commissioner for Oaths, Notary
Public or Justice of the Peace.

_____
signature of the person named above

SASKATCHEWAN REGULATION 193/70

UNDER THE PUBLIC HEALTH ACT
(O.C. 1143/70)

(Filed August 14, 1970.)

Regina, August 10, 1970. Approved and Ordered. Lieutenant Governor. The Executive Council has had under consideration a report from the Minister of Public Health dated July 27, 1970 stating that it is provided by clauses (w), (x) and (z) of subsection (1) of section 72 of The Public Health Act that:

"72.—(1) Subject to the approval of the Lieutenant Governor in Council, the minister may make rules, orders and regulations which he deems necessary for the protection or in the interests of the public health and the relief of destitution, and, without prejudice to the foregoing general power, for all or any of the following purposes:

(w) the situation, inspection, equipment, quarantining and sanitary management of market gardens, creameries, dairies, cowsheds and stables in connection therewith, including the testing of cattle for tuberculosis, infectious bovine abortion, or any disease communicable to human beings;

(x) defining the standards of milk, cream and ice cream used for human consumption within the province;

(z) respecting the pasteurization of milk and the equipment and operation of pasteurizing plants, and defining the process of pasteurization".

The Minister further states that it is deemed expedient that the regulations in the schedule hereto attached, marked "Schedule A", governing the pasteurization of milk and the equipment and operation of pasteurizing plants, and defining the process of pasteurization, defining the standards of milk, cream and ice cream, and governing various matters relating to dairies, be approved.

Upon consideration of the foregoing report and on the recommendation of the Minister of Public Health, the Executive Council advises that pursuant to the provisions of clauses (w), (x) and (z) of subsection (1) of section 72 of The Public Health Act, His Honour's Order do issue:

(a) approving, effective on, from and after the 1st day of September, 1970, the regulations in the schedule hereto attached marked "Schedule A", and

(b) rescinding, effective on, from and after the 1st day of September, 1970, the approval of the regulations approved by Order in Council 1136/59 dated July 7, 1959.

M. A. DE ROSENROLL,
Clerk of the Executive Council.

"SCHEDULE A"

REGULATIONS GOVERNING MILK AND CERTAIN MILK PRODUCTS

Interpretation

1. In these regulations the expression:

(a) "acidified milk and cream" means pasteurized milk and cream in which protein coagulum and acidic content are produced by the addition of food grade organic ingredients;

(b) "administrative authority" means an appointed milk sanitarian or any other person appointed by the minister for the purpose of administering these regulations;

(c) "analyst" means a person appointed as an analyst for the purpose of these regulations;

(d) "approved" means approved by an administrative authority;

(e) "bacterial culture" means a group of harmless acid producing bacteria;

(f) "buttermilk, cultured" means fluid milk in which a distinct flavour and coagulum is developed from pasteurized milk with the aid of a bacterial culture;

(g) "commingled milk" means the product realized by the addition of a supply of milk from one dairy farm to a supply of milk from one or more other dairy farms with the result that the milk included therein from any one dairy farm cannot be distinguished or separated from the milk from any of the other dairy farms;

(h) "cottage cheese" means the distinctive curd particles produced from the coagulum resulting in the precipitation of protein by the growth of a bacterial culture;

(i) "dairy" means a place where one or more cows or goats are kept, a part or all of the milk or cream from which is sold, offered for sale or delivered for human consumption, and includes all buildings, yards and premises occupied or used in connection with the production of milk;

(j) "department" means the Department of Public Health;

(k) "depot" includes any milk warehouse, store, market, shop, public eating establishment, or other similar place where milk, cream or other milk products including ice cream mix are kept or stored to be sold, offered for sale or delivered for human consumption;

(l) "distributor" means a person who sells, offers for sale or delivers milk or milk products to another person;

(m) "flavoured dairy drink" means a milk product to which natural or artificial flavouring has been added imparting a distinctive flavour;

(n) "homogenized milk" means milk which has been subjected to a mechanical process that prevents visible separation of milk fat;

(o) "ice cream" means a frozen food made from ice cream mix;

(p) "ice cream mix" means the combination of cream, milk or other milk products, with or without the addition of flavouring, fruit, nuts or confections, which when frozen produces ice cream;

(q) "manufactured milk product" includes, butter, frozen desserts, cheddar cheese, dried milk solids, as well as sterilized milk hermetically sealed in a container and so processed either before or after sealing as to prevent bacterial spoilage;

(r) "milk" means the natural lacteal secretion obtained by the milking of one or more cows or goats, and includes cream, skim milk and any other portion of the whole milk;

(s) "milk product" includes skim milk, cream, acidified or cultured milk products, ice cream mix, ice milk mix, vitamin fortified milk, reconstituted milk, concentrated milk, cottage cheese, flavoured dairy drink, or any other product made wholly or principally from milk but does not include milk for manufactured milk products;

(t) "milk sanitarian" means a person who is employed by the department as a milk sanitarian;

(u) "minister" means the Minister of Public Health;

(v) "notifiable communicable disease" means a notifiable communicable disease within the meaning of the regulations made by the minister for controlling communicable diseases;

(w) "official methods of analysis" means the most recent publication of the Committee of the Association of Official Agricultural Chemists, and the approved amendments thereto;

(x) "operator" means the proprietor, owner, manager or person temporarily or permanently in charge;

(y) "pasteurize" means the process of heating and cooling every particle of milk for the purpose of destroying pathogenic bacteria which may be present in milk, and the word "pasteurized" has a corresponding meaning;

(z) "pasteurizing plant" means a building in which milk is pasteurized and includes every structure, machine, apparatus, equipment and appurtenance employed in or necessary for the pasteurizing, storing, cooling, processing, packaging or otherwise handling of milk or milk products;

(aa) "person" includes any body corporate and the heirs, executors, administrators, assigns or other legal representatives of such person;

(bb) "pocketing" means a dead end where milk may accumulate and remain outside of the intended flow;

(cc) "potable water" means water that is safe for human consumption;

(dd) "pre pasteurized milk" means milk destined for pasteurization;

(ee) "processing plant" includes a plant for manufacturing milk products;

(ff) "producer" means the operator of a dairy who sells fresh milk;

(gg) "producer-distributor" means a milk producer who sells, offers for sale or delivers for human consumption milk or cream of which he is the producer;

(hh) "raw milk" means milk that is not pasteurized in accordance with these regulations;

(ii) "reconstituted milk" means milk resulting from the combining of milk constituents with water;

(jj) "sanitize" means the application of an effective method or substance to a clean surface for the purpose of destroying bacteria;

(kk) "sour cream" means semi-fluid cream, in which acid is developed from pasteurized cream with the aid of a bacterial culture;

(ll) "standard methods" means the most recently published recommendations for the examination of dairy products as formulated by the Committee of the American Public Health Association, and the approved amendments thereto;

(mm) "3-A Sanitary Standards" means the standards of fabrication and design for dairy equipment formulated in the United States of America jointly by the International Association of Milk, Food and Environmental Sanitarians, the United States Public Health Service and the Dairy Industry Committee (I.A.M.F.S., U.S.P.H.S., and D.I.C.) as amended from time to time;

(nn) "vitaminized milk" means pasteurized milk in which the content of Vitamin A or Vitamin D has been increased by a method approved by the minister;

(oo) "warehouse" means a building in which milk is stored before it is sold or delivered, and which is not located in or directly connected to a building housing a pasteurizing plant.

Administration and Inspection

2. An administrative authority shall be responsible for administering these regulations within the limits of his assigned area of jurisdiction.

3.—(1) An administrative authority without a warrant may enter and inspect at all reasonable times any premises, building, enclosure or other place, where milk or a milk product intended for human consumption is produced, kept, received, stored, treated, processed, sold, offered for sale or delivered, and may open any container located therein, and may inspect any vehicle in which it is believed by him that milk or a milk product is being kept.

(2) An administrative authority may obtain samples of milk or milk products without payment where the milk or a milk product is kept, stored, sold, offered for sale or delivered, and submit for analysis samples of:

(a) milk from cows or goats in any dairy;

(b) milk or milk products in any premises, building, vehicle, enclosure or other place.

4. Every person in charge of a vehicle in which milk or a milk product is transported shall permit an administrative authority to inspect the vehicle and take samples.

5. All milk and milk product samples shall be analyzed at a laboratory within two days of being pasteurized, and

(a) shall be examined in substantial compliance with standard methods and official methods of analysis; and

(b) shall be plated on solid media for standard plate count and coliform count, expressed in numbers per millilitre.

6.—(1) At the request of the administrative authority a pasteurizing plant shall submit to a laboratory milk and milk product samples for chemical and bacterial analysis.

(2) Samples of milk or milk products shall be taken while in the possession of the distributor at any time prior to final delivery to a consumer and are to be maintained at a temperature between thirty-two degrees Fahrenheit and forty-five degrees Fahrenheit from the time of collection until the time of analysis.

7. Samples of milk and milk products representing a pasteurizing plant's regular production shall be submitted to a designated laboratory at regular weekly intervals and be properly labeled to identify the product contained therein and as to whether pasteurized or not pasteurized.

Approvals

8.—(1) No person shall establish, construct, alter, enlarge or operate a pasteurizing plant unless the written approval of the minister has been obtained.

(2) A warehouse shall comply with the same requirements as those that apply to pasteurizing plants under these regulations.

9.—(1) Two sets of properly prepared plans for any pasteurizing plant or any warehouse that is constructed, reconstructed or altered shall be submitted to the minister for approval, of which one set shall be returned to the owner.

(2) When approval is granted to operate a pasteurizing plant or warehouse, one copy of the plan and specifications shall remain with the minister and the plan and specifications together with a description of the equipment, arrangement of equipment, and the method of operation employed or to be employed shall be subject to his approval.

10.—(1) Upon proof satisfactory to the minister that any pasteurizing plant has complied with the requirements of these regulations, he may issue a certificate of approval therefor.

(2) Every certificate of approval shall expire on the last day of the calendar year in respect of which it is issued.

(3) The minister may issue annually a certificate of approval for any pasteurizing plant if he is satisfied that the pasteurizing plant has complied with these regulations and that the chemical and bacterial quality of the pasteurized milk and milk products pasteurized in that plant has been reasonably adequate.

(4) The minister may suspend or revoke any certificate of approval or renewal thereof, if he is satisfied that the pasteurizing plant for which the certificate is issued does not comply with the provisions of these regulations or that the chemical and bacterial quality of the pasteurized milk and milk products pasteurized in that plant has not been reasonably adequate.

Pasteurizing Plants and Equipment

11. All outside openings into any pasteurizing plant shall be effectively screened or otherwise protected against the entrance of flies, rats and other vermin. Additional precautions for the control of flies, rats and other vermin shall be provided, as may be necessary, or as the administrative authority may direct.

12. The level of illumination shall not be less than fifty foot candles in the working area where:

(a) milk bottles are being washed for subsequent filling; and

(b) milk bottles or packages are being filled.

13. A pasteurizing plant shall not contain odours other than those resulting from the handling, processing or storing of fresh milk and milk products.

14.—(1) The floor of every room in which milk is handled or stored shall:

(a) be constructed of concrete, ceramic tile, or other good quality impervious material;

(b) be smooth, readily cleansed and sloped to convenient outlet drains having a trap of not less than four inches;

(c) be constructed and drained in a manner that prevents pooling or entrapment of liquid; and

(d) be kept clean and in good repair.

(2) The walls and ceilings of rooms in which milk is handled or stored shall have smooth surfaces of impervious and washable material, be light in colour, and shall be kept clean and in good repair.

15. A potable water supply shall be provided. Non-potable water shall not be distributed to any part of a milk processing plant in which food is being prepared.

16.—(1) Unless otherwise approved, a separate room shall be provided in a pasteurizing plant for each of the following operations:

(a) milk receiving, milk can washing and cleaning bulk milk transport trucks;

(b) pasteurizing, cooling and bottling;

(c) bottle washing, bottle storage and can washing;

(d) storage of packaging material or supplies.

(2) Where separate rooms are required, doors leading into the pasteurizing or milk processing room shall be self-closing and shall not open directly into any stable, garage, boiler room, restroom, compressor room or living quarters.

(3) All rooms excepting refrigerated cold storage rooms in which milk and milk products are kept, pasteurized or manufactured, shall be ventilated to keep them free of odours and prevent excessive condensation from collecting on the walls and ceilings; and pressurized ventilating systems shall have a filtered air intake.

17. Unless otherwise approved, milk and milk products shall be processed in a room separate from that used for the manufacture of butter, cheddar cheese, dried milk solids or other manufactured milk products.

18. Washing and toilet facilities shall be provided for employees as required by the administrative authority and no door from a toilet shall open directly into the pasteurizing room.

19. All liquid wastes and drainage from the operation of any pasteurizing plant, or any milk depot shall be discharged into a sewerage system.

20. Refuse shall not accumulate in a pasteurizing plant or in a milk depot, or on or near the premises thereof except in properly covered containers or receptacles.

21.—(1) The fabrication, design and installation of all equipment and containers used in producing, preparing, pasteurizing, processing and storing milk and milk products shall:

(a) be kept in such repair that cleaning and sanitizing will be effective at all times; and

(b) where not specified in these regulations follow the recommendations set out in 3-A Sanitary Standards.

(2) Installation of used equipment is subject to prior approval of the minister and shall be reconditioned if required before being put into use.

22. Pasteurizing, processing, washing, bottling, packaging, storing, preparing and other auxiliary equipment for handling milk and milk products, ice cream and cottage cheese along with such other necessary pieces of equipment, excepting integral parts of the same equipment or that which is built into or forms a part of a wall, shall be spaced at a minimum of twenty-four inches from any wall or other equipment.

23. Corroded equipment or containers shall not be used.

24. Milk receiving and pasteurizing vats shall be placed and protected, to prevent environmental contamination of the contents during operation and the vats shall be adequately insulated and provided with tight fitting covers.

25.—(1) Only approved piping and fittings may be used for pasteurized milk and it shall be of such design, size and material that it may be effectively cleaned.

(2) The length of piping shall be reduced to a minimum and no piping, pumps or other similar equipment shall be used for both pasteurized and unpasteurized milk.

(3) Milk passages shall be constructed and maintained to prevent pocketing.

26. All prefabricated containers and materials used for packaging milk or other milk products, ice cream or cottage cheese shall be stored in a clean, dry room and be properly protected against environmental contamination.

27. The use of cleaned-in-place piping and appurtenances is subject to the approval of the administrative authority.

28. Refillable plastic milk bottles shall not be used, unless the written approval of the minister is first obtained.

29. Refillable milk bottles shall be used for milk and milk products only and not for any other product.

30. Only approved bottle washers shall be used for washing refillable bottles.

31. Fabricated non-refillable milk containers shall be filled in the plant where they are formed immediately after being formed, unless they are fabricated in such a manner that a complete atmospheric seal is maintained until filling takes place.

32. Only cold milk separators shall be used in a pasteurizing plant to separate milk, unless fully integrated facilities forming a part of the equipment provides cooling of separated skim milk and cream to forty-five degrees Fahrenheit or less, within a minimum of one hour after separating takes place.

33. When milk or ice cream mix is homogenized it shall be pasteurized after it has been homogenized, unless:

(a) the temperature at the time of homogenization exceeds one hundred and fifty-five degrees Fahrenheit; and

(b) it is homogenized in equipment that is designed and installed in accordance with the recommendations set out in 3-A Sanitary Standards.

34.—(1) Where air under pressure is supplied for agitation or movement of milk and milk products or is directed at a milk contact surface, it shall be free of oil, dust, rust, excessive moisture, extraneous materials and odour; and the recommendations relating to the supplying of air under pressure set out in 3-A Sanitary Standards shall apply.

(2) Whenever steam is used in direct contact with milk or milk product surfaces, it shall be of culinary quality. Boiler feed water treatment additives containing cyclohexylamine, octadecylamine, morpholine, chromium, hydrazine and other toxic substances shall not be used.

35. Milk and milk products shall not be strained through woven wire or cloth, and pasteurized milk shall not be strained except through a perforated metal screen constructed of non-corrosive material unless otherwise approved by the minister.

36. Milk cooling equipment shall be provided with sufficient capacity to cool milk or milk products to a temperature of forty-five degrees Fahrenheit or less prior to and during the time of any storage period in the plant.

37. A surface cooler shall be provided with:

(a) a drip deflector or other device to prevent water from condensation coming in contact with the milk or the cooling surfaces;

(b) an enclosing cover if so directed by the administrative authority.

38. All regenerative tubular or plate heat exchangers shall be so constructed, operated and maintained that there is absolutely no possibility of mixing unpasteurized milk, water or other heat exchanging liquid with pasteurized products.

39.—(1) Pasteurized milk and milk products shall be packaged or bottled and capped at the pasteurizing plant where pasteurization takes place.

(2) All pasteurized milk and milk products shall be packaged or bottled and capped by mechanical means only.

(3) All pasteurized milk and milk products bottled in refillable bottles shall be hooded or capped with an enclosure covering the pouring lip of the bottle.

40.—(1) Every refillable bulk container employed in the storing or marketing of pasteurized milk, cream, ice cream mix or other milk product shall be washed in facilities provided for cleaning and other preparation as may be required, separate from washing facilities used for raw milk containers; and

(a) be free from rust and other types of corrosion;

(b) be sealed at the pasteurizing plant; and

(c) have attached thereto a label indicating the type of product contained therein and the date of pasteurization.

(2) For the purpose of clause (c) of subsection (1) of section 40, the date of pasteurization may be indicated by a statement of the date itself or by means of a code made known to the administrative authority.

41.—(1) Adequate cold storage facilities shall be provided in a pasteurizing plant for milk held both prior to and after pasteurizing.

(2) No unpasteurized milk or milk products shall be stored in a cold storage room along with pasteurized products unless there is adequate separation to prevent the possibility of inadvertent mixing.

42. Storage tanks used in handling milk or milk products shall not be used for any other purpose except milk and milk products, or potable water.

Method and Process

43. Every pasteurizing procedure shall be under the direct supervision of a competent person having an adequate knowledge of the procedure.

44.—(1) Subject to subsection (2), the process of pasteurizing milk and milk products shall be as follows:

(a) "batch method" by heating every particle of milk or milk product to a temperature of not less than one hundred and forty-five degrees Fahrenheit and holding it at this temperature for a minimum of thirty minutes and then cooling it to a temperature of forty-five degrees Fahrenheit or less and maintaining it at this temperature until sold or delivered; or

(b) "high temperature short method" by heating every particle of milk or milk product to a temperature of not less than one hundred and sixty-one degrees Fahrenheit and holding it at this temperature for a minimum of sixteen seconds and then cooling it to a temperature of forty-five degrees Fahrenheit or less and maintaining it at this temperature until sold or delivered.

(2) Cream, ice cream mix and flavoured dairy drinks shall be pasteurized at a temperature of not less than one hundred and fifty-five degrees Fahrenheit for a minimum of thirty minutes and then cooled to forty-five degrees Fahrenheit or less, or by such other method as may be approved by the administrative authority.

45.—(1) Every pasteurizing vat shall be equipped with an indicating and a recording thermometer, and similar equipment shall be provided for high temperature short time pasteurizing equipment.

(2) The bulb of the indicating thermometer and the recording thermometer shall be located as close together as practicable.

46. Indicating thermometers shall be of a type easily read and shall be accurate within one-half of one degree Fahrenheit in the pasteurizing range.

47.—(1) Recording thermometers shall be of a type easily read and charts shall be graduated:

(a) for one revolution in twelve hours;

(b) so the smallest time scale division does not exceed ten minutes;

(c) so the scale divisions will read accurately in degrees at the pasteurizing range.

(2) No recording chart shall be used for a period that interferes with the clarity of records, or results in overlapping of graphs.

(3) Each daily recording chart shall be initialled by the operator of the pasteurizing equipment and the day of the month along with the type of product that is pasteurized shall be indicated. If more than one vat is used the identifying number of the vat shall be indicated.

(4) Charts shall be kept for a period of three months after the date recorded thereon and shall be made available to the administrative authority upon request.

(5) The temperature shown by the recording thermometer shall be checked daily by the operator against the indicating thermometer and shall be adjusted to read the same as the indicating thermometer in the pasteurizing range.

48. Where the method of pasteurizing is according to the batch method as set out in clause (a) of subsection (1) of section 44:

(a) the cover of the pasteurizing vat shall be kept closed during the holding period and until the milk is removed, except in case of emergency;

(b) milk and milk products shall not be cooled in a pasteurizing vat to a temperature below one hundred and twenty degrees Fahrenheit;

(c) milk and milk products shall be cooled to forty-five degrees or less, within one hour after the holding period is completed;

(d) the operation of any pasteurizing vat shall be such that variation in temperature between the hottest and coldest sections will not exceed one degree Fahrenheit;

(e) every pipe used to convey raw milk to a pasteurizing vat shall be entirely disconnected before pasteurizing begins and the inlet to the pasteurizing vat shall be capped;

(f) every inlet and outlet valve to or from a pasteurizing vat shall:

(i) be located and maintained so that leakage or short circuiting of unpasteurized milk into pasteurized milk or into a pasteurizing vat other than that being filled will be prevented;

(ii) if not specified in these regulations the accredited recommendations outlined in 3-A Sanitary Standards will apply;

(g) the outlet valve shall have the seat either flush with the inner wall of the pasteurizing vat or be so closely coupled that no cold pocket will exist.

49. Where the method of pasteurizing is according to the high temperature short time method as set out in clause (b) of subsection (1) of section 44:

(a) a flow-diversion valve shall be located at the outlet of the holding facilities and two milk escape pressure release pop-type valves shall be located in the valve housing for the release of hydraulic pressure between the double sealing gaskets of the valve in the closed position of the forward flow:

(b) the flow-diversion valve shall be equipped with a manually operated switch located on the valve assembly;

(c) the controls shall be set and sealed for the flow-diversion valve to divert at a minimum temperature of one hundred and sixty-one degrees Fahrenheit and should this seal be broken, the administrative authority shall be notified:

(d) the "open" and "close" position of the flow-diversion valve shall be recorded on the chart;

(e) the variable speed control of the timing pump shall be set at the maximum rated capacity and sealed at the time of installation and should this seal be broken, the administrative authority shall be notified;

(f) the timing pump shall have its driving mechanism so designed that in case of wear, belt stretch or any other condition affecting the capacity of the pump, the capacity will not increase;

(g) the discharge from the timing pump shall be upstream from the flow-diversion valve, and the outlet from the pre pasteurized regenerative section of the press shall be coupled to the intake of the timing pump;

(h) the motor of the timing pump shall be interwired with the flow-diversion valve and the safety thermal limit recorder so the timing pump cannot operate below the required temperature unless the flow-diversion valve is in the fully closed position of the forward flow;

(i) if a homogenizer is independently capable of producing forward flow, the homogenizer motor shall be interwired with the flow-diversion valve and the safety thermal limit recorder so the homogenizer cannot operate below the required temperature unless the flow-diversion valve is in the fully closed position of the forward flow, and the homogenizer shall be located upstream from the flow-diversion valve and downstream from the pre pasteurized outlet of the regenerative section of the press;

(j) where pre pasteurized milk to pasteurized milk regenerative heat transfer equipment is used, the pressure on the pasteurized milk side shall always be at least one pound per square inch greater than the pressure on the raw milk side;

(k) a booster pump shall not be used if its location and operation creates in any way an alteration of the pressure relationship between pre pasteurized and pasteurized milk in the press;

(l) a constant level tank shall be located in the milk flow line ahead of the pasteurizing equipment so the level of milk in the tank will not at any time exceed the lowest level of milk in the press;

(m) the holding facilities shall be designed to provide for the holding of milk for a minimum of sixteen seconds at a minimum temperature of one hundred and sixty-one degrees Fahrenheit and holding tubes shall slope continuously upward from the milk inlet.

50. Unless otherwise approved by the minister only products of which milk is a substantial component shall be handled or processed in a pasteurizing plant.

51. No unpasteurized milk shall be bottled or packaged in a pasteurizing plant nor shall such milk be placed in a container for delivery to a consumer.

52.—(1) All pasteurizing apparatus including valves and pipe fittings, except cleaned-in-place equipment or piping shall be taken down daily for cleaning and after each cleaning shall be stored in a manner to protect them from contamination.

(2) Every container and any equipment, piping or valves used for handling milk or milk products, shall be thoroughly cleaned after use, and at least once after the completion of each operating period and shall be effectively sanitized immediately before subsequent use.

53. After bottles, cans and other refillable milk or milk product containers have been washed and sanitized they shall be effectively protected from contamination by splash, flies or dust until filling takes place.

54. Unless otherwise approved, milk or milk product containers shall be filled immediately after they are washed and sanitized.

55.—(1) Milk and milk products not previously pasteurized in accordance with these regulations shall be pasteurized in accordance with these regulations before sale or delivery.

(2) Pasteurized milk and milk products which have come in contact with contaminated machinery or have overflown from routine operations or defective equipment shall not be used for human consumption.

56. A storage tank or vat for milk and milk products shall be cleaned and sanitized after each and every period of use at regular intervals determined by the process for which it is employed.

57. Milk that is likely to be held for any period of time in a pasteurizing plant shall register upon test a temperature of forty-five degrees Fahrenheit or less.

58.—(1) Milk stored in a pasteurizing plant shall be clean, cool and of good quality.

(2) Milk that is tainted, sour, unpalatable, dirty or otherwise unsatisfactory shall not be used by the pasteurizing plant for milk or milk products.

59. Milk not accepted by the pasteurizing plant may be coloured with a harmless food colouring and shall be returned to the producer or otherwise disposed of as the administrative authority may direct.

Standards of Quality for Milk and Milk Products

60. No process other than pasteurization consistent with the provisions of these regulations along with appropriate refrigeration methods shall be applied to milk and milk products for the purpose of removing or deactivating bacteria.

61. The chemical and bacterial quality of milk or a milk product other than sour cream, buttermilk, cottage cheese and yoghurt, sold, offered for sale or delivered for human consumption is not adequate where:

(a) the milk or milk product upon being subjected to a test known as the phosphatase test has a positive reaction to such test; or

(b) the milk or milk product upon being subjected to a test known as the standard plate count is found to have a bacteria content equivalent to thirty thousand bacterial colonies per millilitre or greater; or

(c) the milk or milk product upon being subjected to a test known as the coliform plate count is found to contain three or more coliform bacteria per millilitre.

62. The chemical and bacterial quality of sour cream, buttermilk, cottage cheese and yoghurt, sold, offered for sale or delivered for human consumption is not adequate where:

(a) the milk product upon being subjected to a test known as the phosphatase test has a positive reaction to such test; or

(b) the milk product upon being subjected to a test known as the coliform plate count is found to contain more than three coliform bacteria per millilitre.

63. The chemical and bacterial quality of milk and milk products sold, offered for sale or delivered for human consumption by a producer-distributor is not adequate where:

(a) the milk or milk product upon being subjected to a test known as the resazurin test is reduced to mauve pink (P5 7/4 Munsel Color Standard) in less than three hours;

(b) the milk or milk product upon being subjected to a test known as the standard plate count is found to have a bacteria content equivalent to seventy-five thousand bacterial colonies per millilitre or greater;

(c) the milk or milk product is found to be adulterated with added water, bactericidal substance, colouring matter, preservative, antibiotic or other substance; or

(d) the milk or milk product upon being examined is found to contain:

(i) a substance for destroying fungi, insects, rodents or any other pest; or

(ii) a substance used for destroying weeds.

64.—(1) Any producer-distributor in charge of a dairy herd consisting of one or more cows or goats shall, upon request by the administrative authority, or medical health officer furnish him with a statement from a qualified veterinarian indicating all the animals in the herd have been tested for tuberculosis, infectious bovine abortion and "Q" fever.

(2) No milk drawn from cows or goats which have reacted positively to the test for mastitis, tuberculosis, infectious bovine abortion, or "Q" fever shall be sold, offered for sale or delivered for human consumption.

(3) Where a dairy herd or any animal or goat therein has been tested for mastitis, tuberculosis, infectious bovine abortion or "Q" fever and one or more reactors have been found in the herd, all milk sold, offered for sale or delivered for human consumption shall be pasteurized, until such time as a statement from a qualified veterinarian is obtained indicating the remaining animals are free of disease.

65. The bacterial quality of commingled milk intended to be pasteurized for the purpose of sale, offering for sale or delivery for human consumption is not adequate where the commingled supply is tested for the standard plate count and found to be equivalent of three hundred thousand bacterial colonies per millilitre or greater.

66. Whenever commingled milk is analyzed by a laboratory, the person in possession of the commingled milk shall identify all the individual milk producers whose milk forms part of the commingled milk and the milk produced by each of such producers shall, in turn, be analyzed if the bacterial quality of the commingled milk is found to be inadequate pursuant to section 65.

General

67.—(1) Every container in which pasteurized milk and milk products are kept or offered for use for human consumption, or sold or offered for sale, excepting bulk containers used for holding milk in a pasteurizing plant shall be labeled in plainly legible characters to designate the product contained therein.

(2) The word "pasteurized" and the identity of the pasteurizing plant or the distributor shall appear on the caps of all bottled pasteurized milk and milk products, or on the containers.

(3) Milk or a milk product shall be deemed to be misbranded if there is attached to it when kept or offered for use for human consumption, or sold or offered for sale, a label or mark containing any untrue or misleading name, device, or statement or it is not labeled or marked in accordance with the provisions of these regulations.

68. All milk or milk products sold, offered for sale or delivered for human consumption shall be in a container approved by the minister.

69.—(1) Every container in which milk, or a milk product is kept, offered for sale, sold or delivered for human consumption shall, if the minister so orders, have designated on the container in plainly legible characters such markings as to indicate the day when pasteurization takes place.

(2) If the minister makes such an order, the date of pasteurization may be indicated by a statement of the date itself or by means of a code made known to the administrative authority.

(3) Where an order is made by the minister for the purpose of subsection (1), the order may be stated to apply:

(a) to all milk and milk products sold, offered for sale or delivered for human consumption within the province; or

(b) to all milk and milk products sold, offered for sale or delivered for human consumption that have been pasteurized in a milk pasteurizing plant specified in the order; or

(c) to all milk and milk products kept, sold, or offered for sale in, or delivered for human consumption by, a milk depot specified in the order.

(4) Where an order is made by the minister for the purpose of subsection (1) the order may also state that upon the expiry of a period of time specified in the order following the date upon which the milk or milk product is pasteurized, it shall not be sold, offered for sale or delivered for human consumption.

70. Where milk is dispensed from a bulk dispenser it shall be pasteurized and homogenized.

71. In cities and towns having a population of one thousand or more as shown by the last federal census; milk sold or offered for sale to customers in public eating establishments for consumption on the premises shall be served:

(a) in the original sealed bottle or container filled and capped at an approved pasteurizing plant; or

(b) from an approved dispenser cleaned, filled and sealed at an approved pasteurizing plant and the seal shall not be broken by the consignee.

72. No person shall fill or refill with pasteurized milk, or a milk product, any bottle or other container with intent to sell, offer for sale or deliver unless the bottle or container is firstly thoroughly cleaned and sanitized in an approved pasteurizing plant.

73.—(1) All vitaminized, reconstituted or flavoured milk or milk beverages shall be pasteurized and the manufacturer shall submit a list of ingredients to the minister for approval.

(2) The minister may require any part of, or cause the complete list of ingredients to be printed on the container.

74. Cottage cheese, buttermilk, sour cream, yoghurt and other cultured milk products shall not be manufactured from raw milk or raw cream until it has first been pasteurized.

75. Ice cream mix, ice milk mix, flavoured dairy drinks and all other products containing milk shall be manufactured or processed under sanitary conditions equivalent to those specified for the pasteurization of milk.

76. Ice cream storage vats, freezers, fruit, flavouring and nut adding equipment shall be cleaned and sanitized at regular intervals as determined by daily usage, after the operation is completed and no subsequent day's operation shall commence until the equipment has first been sanitized.

77. Before a milk processing plant begins manufacturing a new product the operator thereof shall first obtain the written approval of the minister.

77. Milk or a milk product that has been pasteurized in another province shall not be kept, sold, offered for sale or delivered in Saskatchewan for human consumption, unless the minister is satisfied the plant in which the milk is pasteurized is licensed or approved by the body authorized by the laws of that province to license or approve pasteurizing plants.

Milk Depot

79. A person shall not operate a milk depot unless the milk depot is approved by an administrative authority.

80. Every person operating a milk depot shall on the request of the administrative authority furnish him with the name and address of every person from whom he obtains milk, or other milk products.

81. Milk and milk products kept, sold, or offered for sale in any milk depot shall at all times register upon test a temperature not higher than forty-five degrees Fahrenheit and shall be stored in an approved cooler or refrigerator and every cooler or refrigerator shall be properly drained, defrosted regularly and maintained in a clean and sanitary condition.

82. All vehicles used for transporting milk or milk products shall be constructed and operated to protect the content from exposure to excessive heat, cold or contamination and shall be kept clean.

Communicable Disease

83.—(1) Every person employed directly or indirectly with the preparing, pasteurizing, processing, manufacturing, bottling, packaging, filling, capping, or otherwise handling of milk and milk products shall:

(a) be cleanly in his habits;

(b) wear clean, white, washable outer garments including head-gear;

(c) keep his hands clean while engaged in work;

(d) submit to such examination or tests as the medical health officer or the minister may require;

(e) refrain from spitting, smoking, chewing tobacco or taking snuff while engaged in work.

(2) No person suffering from, or who is a carrier of typhoid, diphtheria, tuberculosis, brucellosis, dysentery or other notifiable communicable disease which may be spread through the medium of milk shall be employed in producing, processing or distributing milk and milk products.

84. If the operator of a depot, warehouse or milk pasteurizing plant in which milk or milk products are kept, produced, processed, handled, sold, or offered for sale, or from which milk or milk products are delivered or distributed, knows or suspects an employee is suffering from a notifiable communicable disease which may be spread through the medium of milk, he shall notify the medical health officer or the minister.

Order of Medical Health Officer or Milk Sanitarian

85.—(1) A medical health officer or milk sanitarian may by notice in writing order a producer-distributor to cease selling, offering for sale or delivering milk for human consumption from any premises where:

(a) the milk from the dairy fails to comply with the standards required in section 63; or

(b) a communicable disease exists.

(2) The notice mentioned in subsection (1) shall fix the date upon which milk shall cease to be sold, offered for sale, or delivered for human consumption and shall state the reason why the order was given.

(3) The notice mentioned in subsection (1) may either:

(a) fix a period within which the producer-distributor shall not sell, offer for sale or deliver milk intended for human consumption; or

(b) prescribe the conditions to be met by the producer-distributor before he may again sell, offer for sale or deliver milk intended for human consumption.

(4) The notice mentioned in subsection (1) may be served on the producer-distributor either personally or by registered mail.

(5) Where the producer-distributor is of the opinion that he has been aggrieved by an order of a medical health officer or milk sanitarian, he may register his disagreement in writing with the minister.

Penalties

86.—(1) A person who infringes any of the provisions of these regulations, or fails to comply therewith or with any order of a medical health officer or milk sanitarian lawfully given, is guilty of an offence and shall be liable on summary conviction to a penalty of not less than ten dollars nor more than one hundred dollars and in default of payment thereof, to imprisonment for a period not exceeding fourteen days.

(2) The imposition of such penalty for failure to comply with these regulations or with an order of the medical health officer or milk sanitarian shall not relieve the person in default from carrying out the work therein mentioned; but he shall be liable on summary conviction, to a further penalty of not less than one dollar nor more than ten dollars for each day after the first penalty is imposed until he has complied with the regulations or order as the case may be, and in default of payment thereof to imprisonment for a period not exceeding fourteen days.
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SASKATCHEWAN REGULATION 194/70

UNDER THE FUR ACT
(O.C. 1151/70)

(Filed August 14, 1970.)

Regina, August 10, 1970. Approved and Ordered. Lieutenant Governor. The Executive Council has had under consideration a report from the Minister of Natural Resources, dated August 5, 1970, stating:

that pursuant to Section 66 of The Fur Act the Lieutenant Governor in Council may make regulations governing the licensing of trappers and regulating trapping operations in Saskatchewan;

that it is deemed advisable and in the public interest to prescribe the periods and areas within which and the conditions upon which it shall be lawful to take certain fur animals;

that it is further deemed advisable and in the public interest to repeal certain regulations.

Upon consideration of the foregoing report and on the recommendation of the Minister of Natural Resources, the Executive Council advises that His Honour's Order do issue, pursuant to Section 66 of The Fur Act, effective on and after the date hereof:

(a) repealing Saskatchewan Regulation 251/69 being Order in Council 1483/69 dated September 26, 1969 and published in *The Saskatchewan Gazette* dated October 10, 1969;

(b) repealing Saskatchewan Regulation 327/69 dated December 19, 1969 and published in *The Saskatchewan Gazette* dated January 2, 1970; and

(c) making the regulations set forth in the attached schedule.

M. A. DE ROSENROLL,
Clerk of the Executive Council.

SCHEDULE

REGULATIONS COVERING OPEN SEASON FOR CERTAIN FUR ANIMALS FOR THE 1970-71 TRAPPING SEASON

1. Subject to the Fur Act and the Regulations made thereunder it shall be lawful to trap, take and kill:

(a) Fisher, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 2nd day of March, 1971, both dates inclusive;

(b) Fox, in the Province of Saskatchewan, in the Northern Saskatchewan Fur Conservation Block only, between the 4th day of November, 1970, and the 16th day of February, 1971, both dates inclusive;

(c) Lynx, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 15th day of April, 1971, both dates inclusive;

(d) Marten, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 2nd day of March, 1971, both dates inclusive; in the Pasquia-Porcupine Fur Conservation Block described in Order in Council No. 1796/59; in the Northern Saskatchewan Fur Conservation Block, described in Order in Council 1796/59; in the Sipanok Fur Conservation Block described in Order in Council No. 679/42; and the Cumberland Fur Conservation Block described in Order in Council No. 901/42;

(e) Mink, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 12th day of February, 1971, both dates inclusive;

(f) Otter, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 1st day of May, 1971, both dates inclusive;

(g) Squirrel, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 16th day of March, 1971, both dates inclusive;

(h) Weasel, in the Province of Saskatchewan, between the 4th day of November, 1970, and the 27th day of February, 1971, both dates inclusive, in the Northern Fur Conservation Areas and in the Rural Municipalities Nos. 4, 7, 8, 9, 18, 31, 32, 33, 35, 42, 46, 51, 69, 76, 93, 94, 99, 121, 123, 125, 126, 128, 129, 130, 132, 137, 142, 152, 153, 155, 158, 163, 166, 168,

APPENDIX 4

DETAILED DESCRIPTION OF THE MINI-DAIRY

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Building

Saskatchewan Regulation 53/79 ("The Dairy Manufacturing Plant Regulations") of the Animal Products Act, 1978 provides criteria for dairy manufacturing plants as does Saskatchewan Regulation 193/70 ("Regulations Governing Milk and Certain Milk Products") under the Public Health Act(see Appendix 3). The consultants estimate that a building of adequate size and meeting these criteria would be approximately 14 feet by 18 feet, providing 252 square feet and cost approximately $44.00/square foot, for a total cost of approximately $11,000. This size is smaller than that identified in a Quebec government report for a plant producing yogourt and cheese (i.e. 15.1 by 22.1 feet, for an area of approximately 340 square feet and a cost of $39.24/square feet); processors contemplating producing other dairy products may wish to consider a larger facility, with expansion potential.

Milk Receiving

The Dairy Manufacturing Plant Regulations require that milk received from dairy producers be stored in milk storage tanks which are (1) designed to hold the product between 1 and 4°C until processed, (2) equipped with a thermometer accurate to within 1°C, and (3) cleaned and sanitized at least once every 72 hours and each time the tank is emptied, unless approved by the administrator of the regulations.

In order to reduce equipment costs, one possible suggestion is that raw milk simply be stored in covered stainless steel pails in a refrigerator. Depending on the daily milk production, processing could then be undertaken every day, every second day, etc. In the 1983 Quebec government cost breakdowns, however, it was suggested that a refrigerated 700 l bulk tank could be obtained for as little as $1500 used (new cost $4500), which may be worth considering if production is planned to increase. Another possible option is to obtain a used cream can cooler, although the price and availability of these is unknown.

Pasteurizer

Small scale vat pasteurization appears to be the only viable alternative for goat milk processing at this time. While European manufacturers can supply small scale infrared pasteurizers (e.g. the Stoutz-Activator with a flow rate of 250 litres/hour), such units cost approximately $30,000, excluding transportation. However, even North American processing vats designed for pasteurizing milk are relatively large (200 gallons U.S., or 757 litres) and expensive (approximately $15,000 Cdn. new).

Because of these problems, it was felt that an innovative approach was necessary. An alternative approach was found in the form of processing kettles used in the restaurant trade. Such kettles are of stainless steel construction, are electrically heated, and can be fitted with an agitator (i.e. the Lightening Mixer) and a recording thermometer, to comply with regulations. This alternative would involve a small processing kettle of approximately 115 litre (30 U.S. gallon) capacity. The new prices for such a kettle, approximately $6,100 Cdn., is much less than for a dairy processing vat, while the capacity is much more reasonable.

The recording thermometer, while representing a substantial cost, has been specified in the Dairy Manufacturing Plant Regulations for a sound reason. The recording thermometer charts are the only official record of proof of pasteurization that a processing plant will have. The only other option, if pasteurization is to be ensured, is to test each individual batch of milk. The practical difficulties and costs of such a process can easily be appreciated.

Again, other options for processing may be available. It might be possible, for example, to locate a used dairy processing vat of a reasonable size and price.

Milk Cooling

Once the milk has been pasteurized, it must be cooled before it can be packaged (or further processed, if desired, to cheese, yogourt, etc.). Cooling systems designed for the dairy industry each consist of a plate cooler coupled with an ice water system (i.e. refrigeration compressor). Such units can cost upwards of $7,000 new, and are again designed for larger operations.

It is believed that an alternative to such systems could be devised using a stainless steel coil flowing through a large plastic container of ethylene glycol in a home freezer. The cost and efficiency of such a system would have to be thoroughly assessed, however, before its feasibility is known with certainty. It is estimated, however, that such a system could be constructed for approximately $1,200.00. This system is only a concept which requires further investigation.

Packaging

This is one area where costs are very difficult to minimize. Individuals involved in the dairy industry unanimously voiced the opinion that for goat's milk to achieve full retail sales potential it will have to be packaged in the Pure-Pak cartons typical of the cow's milk industry. This type of package appears to be in use by virtually all of the goat milk processing operations in Canada.

Pure-Pak cartons, for which the patent is held by Ex-Cello Corp. in the U.S., are of plastic coated paper. They require fairly high heat for sealing, and both the bottom and top must be sealed. Again, European suppliers manufacture manual or semi-automatic packaging machines which would seal these containers, but the costs are prohibitive. A more practical option is to use manual carton sealers supplied by a U.S. manufacturer. Two relatively low cost manual carton former/sealers are now being offered by one U.S. manufacturer. These units, a bottom sealer and a top sealer, are capable of sealing up to 10 cartons per minute, depending on carton and operator. Discussions with the company indicated that the costs for the top and bottom sealers would be approximately $3,000 and $4,000 respectively, in U.S. funds.

Several Canadian suppliers suggested that for less money it would be a simple matter to locate a used machine which would automatically form, fill and seal cartons. A price of approximately $10,000 was most frequently quoted, although it may actually be possible to obtain packaging equipment for much less, according to at least one source.

The reliability of any packaging equipment purchased would have to be assessed by any party establishing a processing plant. It should be noted, however, that used equipment is usually reconditioned. It should also be noted that at least one of the two licensed suppliers of Pure-Pak cartons in Canada provides servicing of equipment to its customers at no charge.

This proposed processing plant contains an additional feature associated with packaging: a food industry stock pot would be used to serve the purpose of a surge tank. Freshly pasteurized milk would enter the surge tank after being cooled. The surge tank could then act as a reservoir from which cartons would be filled. In this way the rate of packaging is not directly dependent on the rate of cooling.

Cleaning

A number of pieces of equipment for cleaning purposes would be required, including a water heater, wash station with sink, and equipment for cleaning in place (CIP) of the pasteurizer and other systems. Again, it is important to note that the Dairy Manufacturing Plant Regulations contain a number of requirements regarding cleaning and sanitation.

Bonding

It should be noted that the operator of the dairy plant may be required to post a bond before a dairy manufacturing plant license is issued. Such a bond is not likely to represent a very substantial portion of the start up costs of operation.

Homogenization

Because of the smaller size of the fat globules in goat's milk compared to cow's milk, goat's milk does not have as great a propensity to separate. As a result, several source consider goat's milk to be "naturally homogenized." For this reason, homogenization is not considered necessary in the conceptual mini-dairy process. It appears that other goat milk processing plants in Canada are not homogenizing their milk, according to the labelling on the Pure-Pak cartons. This will result in a considerable saving both in terms of initial capital investment and costs such as depreciation and labour.

APPENDIX 5

A DETAILED DESCRIPTION OF FIXED AND VARIABLE COSTS INVOLVED IN THE MINI-DAIRY CONCEPT

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1. FIXED COSTS

There are several components of fixed costs involved for the potential commercial processing plant described previously. These are discussed below.

(a) Depreciation

The total cost of the plant is assumed to be $38,000, including building. The straight-line method of depreciation was employed over a 10-year period, resulting in annual depreciation expenses of $3,800. The actual depreciation method chosen by an individual processor, particularly as applied to the Capital Cost Allowance for taxation purposes, may be different. This method and rate were chosen for the sake of simplicity, and are assumed to provide a conservative expense figure.

(b) Utilities

A portion of utility costs are fixed, due to a basic monthly charge. In discussions with a representative of Saskatchewan Power Corporation, it was determined that the rural general service rate would apply. This amounts to $9.18 per month ($110.16 per year) for electricity, and $7.90 per month ($94.80 per year) for natural gas. Basic monthly phone rental would be at a business rate of $10.95 per month ($131.40 per year). These utility charges amount to $336.36 per year. It is assumed, therefore, that fixed utility charges in total will amount to $350 per year.

(c) Insurance

Property insurance rates are very difficult to estimate, since these are very site specific. They would depend, for example, on the location (i.e. proximity to fire protection services), and type of construction (i.e. wood frame versus concrete). For the purposes of this study it is assumed that the plant would be located within close proximity to a major urban centre, and that the building would be of wood frame construction. According to one insurance representative, basic fire insurance and extended coverage (i.e. against vandalism, wind, and hail damage) would amount to a premium of $1.00 per $100 coverage for a concrete building (compared to $1.20 for a wood frame building). Property insurance costs for the proposed plant, therefore, are assumed to be $456 per year.

Liability insurance costs depend on the level of sales involved. Given the assumed sales involved in the proposed processing plant, the

insurance representative interviewed gave a conservative estimate of $500 annual premium for $500,000 liability coverage, and $700 for coverage of one million dollars. Whether or not to acquire liability coverage is a basic business decision to be made by the individual processor. Furthermore, it should be noted that liability rates are presently quite volatile. Therefore, these figures should be treated with caution. For the purposes of this analysis, however, it was assumed that the processor would choose to insure for one million dollars liability, and that the annual premium would be $700.

(d) Loan Repayment (Principal and Interest)

For the sake of simplicity, the feasibility analysis is based on the assumption that the plant is financed entirely through long-term debt, at an interest rate of 12% over a period of 10 years. In reality, financing would likely involve a combination of equity financing and debt. It is quite possible that a lower interest loan may be obtained through Saskatchewan's Small Business Interest Reduction Program or the Federal Business Development Bank. However, equity financing should be discounted at a higher rate to provide a sufficient return to the principal(s) to compensate for risk. The discount rate will have to be chosen by the investor(s), who will also wish to undertake an analysis of Net Present Value or Internal Rate of Return for the specific plant being proposed.

2. VARIABLE COSTS

As with fixed costs, variable costs are difficult to estimate precisely, and depend to a large extent on the final form, location, and operation of the processing plant. The assumed variable costs of production are described below.

(a) Packaging

To maximize the safety, taste, quality, shelf-life, and consumer acceptance of the product, the Pure-Pak type of carton is strongly recommended. The nearest supplier of such containers is Somerville-Belkin in Vancouver. Costs of these containers depends on the number of colours used in printing, and the size of the printing run. The minimum order volume is 10,000 units. For the one litre carton, the following prices apply:

Volume Run	Price per 1000 Cartons	
	1 colour	2 colours
10,000	$ 64.58	$ 70.79
20,000	61.65	65.35
30,000	60.45	63.53
40,000	59.80	62.30
50,000	59.35	61.50

Based on the assumption that single colour printing would be chosen, a cost of 6¢ per unit was chosen as the packaging cost in the pro forma income statement and break-even analysis.

(b) Distribution

Distribution costs are more difficult to estimate than packaging costs. However, using the provincial government vehicle mileage rate and assuming a reasonable trip length and frequency to service accounts in the trading area of one of the major urban centres, a per unit distribution cost of 4¢ per litre was estimated.

(c) Utilities

Again, utility costs per unit are very difficult to estimate, and are based on a number of factors, including the type of equipment used. Present utility rates are $6.58 per kilowatt hour of electricity, and 12.9¢ per cubic metre of natural gas, assuming that the latter is available. It is assumed that utilities contribute 5 cents per litre to the variable costs of production. The actual utility costs will have to be determine for a proposed plant based on the specific energy requirements and running times of actual equipment selected.